

HOSPITALIZATIONS AMONG OLDER ADULT UTAHNS: DIFFERENTIALS (1996-98) AND TRENDS (1992-98) IN MOST COMMON DIAGNOSES AND PROCEDURES



AUGUST 2001

**Utah Department of Health
Utah Health Data Committee
Center for Health Data
Office of Health Care Statistics**

HOSPITALIZATIONS AMONG OLDER ADULT UTAHNS: DIFFERENTIALS (1996-98) AND TRENDS (1992-98) IN MOST COMMON DIAGNOSES AND PROCEDURES

AUGUST 2001

**Utah Department of Health
Utah Health Data Committee
Center for Health Data
Office of Health Care Statistics**

**288 N 1460 W
P.O. Box 144004
Salt Lake City, UT 84114-4004
(801)538-7048
www.healthdata.state.ut.us**

Suggested Citation: Utah Health Data Committee. *Hospitalizations Among OlderAdultUtans Differentials (1996-98) and Trends (1992-98) in Most Common Diagnoses and Procedures*. Salt Lake City, UT: Utah Department of Health, 2001

This report is available on the internet at: www.healthdata.state.ut.us/hda/reports/olderadults.pdf

Acknowledgments

This report on older adults hospitalization in Utah, was produced by the Office of Health Care Statistics, under the direction of the Utah Department of Health and its Utah Health Data Committee.

Utah Department of Health

Rod Betit	Executive Director
Richard Melton	Deputy Director
Scott Williams	Deputy Director
Robert Rolfs	Director, Center for Health Data

Office of Health Care Statistics

Wu Xu	Director
Ryley Fogg	IT Programmer Analyst I
Chung-Won Lee	Research Consultant II
John Morgan	Information Analyst Supervisor
Janet Scarlet	Executive Secretary
Gulzar Shah	IT Programmer Analyst II
William Stinner	Research Consultant II
Greg Stoddard	IT Programmer Analyst I

Utah Health Data Committee

Andrew Bowler	Small Business (Chair)
Clark Hinckley	Large Business (Vice-Chair)
Kim Bateman	Physicians
Penny Brooke	Nursing
Orrin Colby	Business
Leslie Frances	Public Health
Annette Herman	HMO Representative
Robert Huefner	Public Health
Wen Kuo	Public Interest
Sandra Peck	Consumer Advocacy
Greg Poulsen	Hospital Representative
Lori Reichard	Consumer Advocacy
Michael Stapley	Third Party Payer

This report was developed and prepared by:

William F. Stinner, M.S., Ph.D.

Gulzar H. Shah, M. Stat, M.S., Ph.D.

Robert T. Rolfs Jr., M.D., M.P.H.

We would like to thank Dr. Lee Bean (Professor Emeritus, University of Utah), Dr. Wu Xu (Office of Health Care Statistics), Sheldon Elman and Randy Moon (Division of Aging) for their comments on earlier drafts of this report. Ms. Yukiko Yoneoka and Mr. Ryley Fogg provided help in graphics and formatting.

The source of data for this report was:

Utah Inpatient Hospital Discharge Data File (1992-98), Utah Health Data Committee/Office of Health Care Statistics, Utah Department of Health. Salt Lake City, Utah, 2001.

For additional information, please contact:

Office of Health Care Statistics
Utah Department of Health
288 N 1460 W
P.O. Box 144004
Salt Lake City, UT 84114-4004
Voice: (801) 538-7048
Fax: (801) 538-9916
Email: wstinner@doh.state.ut.us

Table of Contents

Executive Summary	i
Table of Contents	iii
List of Tables	v
List of Figures	vii
 Introduction	 1
 Data and Procedures	 4
Results	5
References	70
Appendix A: ICD-9-CM Conversion Table (CSS Categories for Primary Diagnoses)	72
Appendix B: ICD-9-CM Conversion Table (CSS Categories for Primary Procedures)	73

List of Tables

Table	Title	Page
Table 1	Number of discharges and total hospital charges by age and gender and percentage of discharges and total charges 65 and over: 1996-98	5
Table 2	Hospital discharge rate (per 10,000 population), mean length of stay (in days), mean hospital charges, and percentage who died in the hospital by age and gender: All hospital discharges: 1996-98.	7
Table 3	Overall annual trend (1992-98) in number and rate (per 10,000 population) of hospital discharges, mean length of stay (in days), mean hospital charges, and percentage who died in the hospital: All discharges for older adults age 65 and over	17
Table 4	Number of discharges, percentage distribution, and hospital discharge rates (per 10,000 population) by age and gender and percentage of discharges female overall and by age: All hospital discharges for adults age 65 and older: 1996-98	29
Table 5	Mean length of stay (in days) and mean hospital charges by gender and age for older adults aged 65 and over: All hospital discharges (1996-98)	31
Table 6	Discharge status percentage distribution by gender and age for older adult Utahns age 65 and over: 1996-98	33
Table 7	Selected primary diagnoses with highest hospital discharge rates (per 10,000 population) and numbers, longest mean length of stay (in days), and highest mean hospital charges among ten most frequent primary diagnoses for female and male older adults age 65 and over: 1996-98	35
Table 8	Selected primary diagnoses with highest percentage who died in the hospital among ten most frequent primary diagnoses for female and male older adults age 65 and over: 1996-98	37
Table 9	Selected primary procedures with highest hospital discharge rates (per 10,000 population) and numbers, longest mean length of stay (in days), and highest mean hospital charges among the most frequent primary procedures for female and male older adults age 65 and over 1996-98	39
Table 10	Selected primary procedures with highest percentage who died in the hospital among ten most frequent primary procedures for female and male older adults age 65 and over: 1996-98	41
Table 11	Selected primary diagnoses with highest hospital discharge rates (per 10,000 population) and numbers, longest mean length of stay (in days), and highest mean hospital charges among ten most frequent diagnoses for older adults age 65-74, 75-84 and 85 and over: 1996-98	43
Table 12	Selected primary diagnoses with highest percentage who died in the hospital among ten most frequent primary diagnoses for older adults age 65-74, 75-84, and 85 and over: 1996-98	45
Table 13	Selected primary procedures with highest hospital discharge rates (per 10,000 population) and Numbers, longest mean length of stay (in days), and highest mean hospital charges among most frequent primary procedures for older adults age 65-74, 75-84, and 85 and over: 1996-98	47

Table	Title	Page
Table 14	Selected primary procedures with highest percentage who died in the hospital among ten most frequent primary diagnoses for older adults age 65-74, 75-84, and 85 and over: 1996-98	49
Table 15	Gender-age subgroup differences in hospital discharge rates for selected most frequent primary diagnoses for older adults age 65 and over: 1996-98	51
Table 16	Gender-age subgroup differences in mean length of stay (in days) for selected most frequent primary diagnoses older adults age 65 and over: 1996-98	53
Table 17	Gender-age subgroup differences in mean hospital charges for selected most frequent primary diagnoses older adults age 65 and over: 1995-98	55
Table 18	Gender variation in percentage who died in the hospital, for selected most frequent primary diagnoses among older adults age 65 and over: 1996-98	57
Table 19	Gender-age subgroup differences in hospital discharge rates for selected most frequent primary procedures among older adults age 65 and over: 1996-98	59
Table 20	Gender-age subgroup differences in mean length of stay (in days) for selected most frequent primary procedures older adults age 65 and over: 1996-98	61
Table 21	Gender-age subgroup differences in Mean hospital charges for selected most frequent primary procedures among older adults age 65 and over: 1996-98	63
Table 22	Gender-age subgroup differences in percentage who died in the hospital for selected most frequent primary procedures among older adults age 65 and over: 1996-98	65
Table 23	Primary payer distributions for four most frequent primary diagnoses: 1996-98	67
Table 24	Primary payer distributions for four most frequent primary procedures: 1996-98	69

List of Figures

Figure	Title	Page
Figure 1	Hospital Discharge Rates (Per 10,000 Population) for the 10 Most Frequent Primary Diagnoses, Older Adult Utahns Age 65 and Over, 1996-98	8
Figure 2	Mean Length of Stay (In Days) for the 10 Most Frequent Primary Diagnoses Older Adult Utahns Age 65 and Over, 1996-98	9
Figure 3	Mean Charges for the 10 Most Frequent Primary Diagnoses Older Adult Utahns Age 65 and Over, 1996-98	10
Figure 4	Percentage of Older Adult Discharges Age 65 and Over Who Died in the Hospital, for Selected Most Frequent Primary Diagnoses: 1996-98	11
Figure 5	Hospital Discharge Rates (Per 10,000 Population) for the 10 Most Frequent Primary Procedures, Older Adult Utahns Age 65 and Over, 1996-98	12
Figure 6	Mean Length of Stay (In Days) for the 10 Most Frequent Primary Procedures Older Adult Utahns Age 65 and Over, 1996-98.	13
Figure 7	Mean Charges for the 10 Most Frequent Primary Procedures Older Adult Utahns Age 65 and Over, 1996-98	14
Figure 8	Percentage of Older Adult Discharges Age 65 and Over Who Died in the Hospital, for Selected Most Frequent Primary Procedures: 1996-1998	15
Figure 9	Annual Number of Hospital Discharges (1992-1998) for Most Frequent Primary Diagnoses (1996-1998), Older Adult Utahns Age 65 and Over	18
Figure 10	Annual Hospital Discharge Rates (1992-1998) for Most Frequent Primary Diagnoses with Highest Discharge Rate (1996-1998) Older Adult Utahns Age 65 and Over	19
Figure 11	Annual Mean length of Stay (In Days) (1992-1998) for Longest of Most Frequent Primary Diagnoses (1996-1998), Older Adult Utahns Age 65 and Over	20
Figure 12	Annual Mean Hospital Charges (1992-1998) for Most Expensive of Most Frequent Primary Diagnoses (1996-1998), Older Adult Utahns Age 65 and Over	21
Figure 13	Percentage of Annual Discharges Listing an In-Hospital Death (1992-1998) Among Most Frequent Primary Diagnoses with Highest In-Hospital Mortality Rates (1996-1998), Older Adult Utahns Age 65 and Over	22
Figure 14	Annual Number of Hospital Discharges (1992-1998) for Most Frequent Primary Procedures (1996-1998), Older Adult Utahns Age 65 and Over	23

Figure	Title	Page
Figure 15	Annual Hospital Discharge Rates (1992-1998) for Most Frequent Primary Procedures with Highest Discharge Rate (1996-1998) Older Adult Utahns Age 65 and Over	24
Figure 16	Annual Mean Length of Stay (In Days) (1992-1998) for Longest of Most Frequent Primary Procedure (1996-1998), Older Adult Utahns Age 65 and Over	25
Figure 17	Annual Mean Hospital Charges (1992-1998) for Most Expensive of Most Frequent Primary Procedures (1996-1998), Older Adult Utahns Age 65 and Over	26
Figure 18	Percentage of Annual Discharges Listing an In-Hospital Death Among Most Frequent Primary Procedures with Highest In-Hospital Mortality Rate (1996-1998), Older Adult Utahns Age 65 and Over	27

EXECUTIVE SUMMARY

Studies of the hospitalization trends, patterns, and experiences of older adults are an important element in ascertaining the impact of older adults on health care resources, the adequacy of their access to health care, as well as the cost and quality of the health care they receive. Projected substantial increases in both the 65 and older and 85 and older population over the next three decades reinforce this importance. Using data from the Utah Inpatient Discharge Database, 1996-98, this report investigates hospitalization frequency, rates for most common primary procedures and diagnoses and associated length of stay, financial charges and payment source, in-hospital mortality, and discharge destination among Utah's older adult population, 65 years of age and over.

Comparison with national estimates: Utah has relatively lower hospital discharge rates, shorter lengths of stay, and lower in-hospital mortality than the nation. This pattern holds overall, among both men and women, as well as in various age subgroups within the older adult population. At the same time, however, Utah shows a wider gender gap among older adults than the nation with men having higher hospital discharge rates and secondarily, in-hospital mortality, both overall and across older adult age groups. For both Utah and the nation, only slight gender differences in length of stay are apparent.

Most frequent diagnoses and procedures: The ten most frequent primary diagnoses comprised a total of more than 57,000 discharges or 38 percent of all discharges among older adult Utahns between 1996 and 1998. Coronary atherosclerosis and other heart disease and pneumonia accounted for more than 8,600 discharges each. Over three of five discharges among older adults involved a procedure (88,870). The ten most common procedures accounted for 36 percent of all procedures involving an older adult. Knee arthroplasty, diagnostic cardiac catheterization/coronary arteriograph, total or partial hip replacement, and percutaneous transluminal coronary angioplasty (PTCA) were the most frequent procedures with about 4,000 or more discharges each.

Trends: The number of annual discharges involving older adults increased by more than one-quarter from nearly 38,000 in 1992 to more than 48,000 in 1998 with the major portion occurring in the first half of the time series. Mean length of stay declined by one-fifth from 6.5 days in 1992 to 5.2 days in 1996, remaining at that level through 1998. Mean hospital charges increased by nearly \$2,300 from \$9,552 in 1992 to \$11,826 in 1998. On the other hand, there was only minimal inter-annual variation in in-hospital mortality with roughly about one in 20 to 25 discharges in each year involving an in-hospital death.

In each year, between 1992 and 1998, discharges having coronary artery bypass graft (CABG) surgery listed as the primary procedure had the longest average length of stay, the highest mean hospital charges, and the highest rate of in-hospital mortality. However, both number and rate of discharges with PTCA surgery as the primary procedure roughly doubled between 1992 and 1998. Mean charge for discharges with PTCA surgery as the primary procedure was over \$6,600 more in 1998 than 1992, an increase of more than 48 percent or about eight percent per annum. Mean charge for CABG surgery increased by \$8,000, an increase of about one-quarter or around four percent per annum.

Gender and age differences: Gender and age differences in hospital discharge rates, length of stay, mean charges, in-hospital mortality, and discharge destination were apparent. Some major gender and age differences were also evident for selected diagnoses and procedures. This diversity reinforces the view that Utah's older population is not homogeneous in terms of its hospitalization patterns and experiences. Overall, and in each older adult age group, men had a higher discharge rate, slightly longer length of stay, longer mean charges and a higher in-hospital mortality rate than women. The older the age group the higher the hospital

discharge rate and in-hospital mortality rate and the lower the mean charges. Length of stay was higher among those 75-84 and 85 and older than among those 65-74. Men and younger persons were more likely to be discharged to home self-care whereas women and older persons were more likely to be discharged to an institutional setting and secondarily, an organized home service.

Primary Payer: As would be expected given this population of older adults, Medicare predominated as the primary payer across diagnoses and procedures with Medicaid playing a minor role. Variation was evident across both diagnoses and procedures regarding the role of managed care as primary payer. The likelihood of having managed care as a primary payer was highest among discharges with either a coronary atherosclerosis or other heart disease diagnosis or a PTCA procedure, the former accounting for one in 17 and the latter one in 14 discharges.

Conclusions: This initial study revealed a number of major trends and patterns in the hospitalization of older adults in Utah. Utah's trends and patterns, while mirroring those occurring in the nation, nonetheless remained divergent. At the same time, the findings of this investigation explicitly demonstrated that older adults were not uniform in their hospitalization rates, length of stay, mean charges, in-hospital mortality, and discharge destination. Major sources of diversity were to be found along age and gender lines as well as across diagnoses and procedures. Moreover, a complex interweaving of age, gender, and specific diagnoses and procedures, both within and across indicators, was evident. Data limitations precluded a detailed assessment of these interrelationships and underlying factors as well as a precise chronicling of the various pathways older adults transit as they circulate among home, hospitals, emergency rooms, and skilled- and semi-skilled nursing facilities. Current and projected demographic changes coupled with both general and older adult-based health policy will require a more thorough understanding of the dynamics of older adult hospitalization. However, it will also require more comprehensive databases permitting a mapping of the entire "network of care", both formal and informal, and how it relates to the characteristics of older adults in Utah and how effectively it meets the volume and composition of their health demands.

INTRODUCTION

Analyses of hospital discharge data can play an important role in population health status assessment, particularly in providing information on clinical care (Rolfs and Xu, 1995). Studies focused on the hospitalization trends, patterns, and experiences of older adults are especially noteworthy in this respect. Older adults exhibit relatively higher rates of hospitalization attributable to factors such as generally higher rates of chronic disease, more debilitating injuries, adverse reactions to prescribed medications and interactions among various types of medication. Furthermore, the severity and progression of their conditions, attendant comorbidities, and otherwise complicating conditions vis-a-vis other age groups raise the possibility of adverse events, longer hospital stays, repeat hospitalizations, and increased hospital costs. Relatively higher costs, especially given the high public component of those costs, have fueled ongoing debates centered on the aggregate impact of older adults on health care resources and the specific types of demands placed on health care delivery systems. Older adult hospitalization, given the nature of their illnesses and accompanying surgical procedures, often entails a longer recuperative period either at home with possible home care services or in other formal settings such as skilled and semi-skilled nursing home facilities. Therefore, data on the volume and rate of hospitalization, length of stay, charges and payment source, in-hospital mortality and discharge destinations, overall and for various kinds of diagnoses and procedures, and how these might vary across different subgroups constitute important input into policy deliberations on these issues and effective health care planning.

At the same time, knowledge concerning hospital utilization and experiences is essential in assessing quality of life among older adults. Recent extensions of life expectancy have generated concern as to whether these extensions will be matched by gains in active as opposed to inactive life expectancy, i.e., a later life marked by continued active involvement as opposed to a life characterized by chronic disease and disability, potentially threatening an active life style. In this regard, it is essential to understand the nature of the encounters of older adults with the health care system, the quality of the health care they receive, and how effective and quality health care might be compromised by any perceived system inefficiencies. Hospitalization data on such indicators as length of stay and in-hospital mortality provide a necessary element in assessing issues centered on older adult's quality of life. Finally, although not central to this study, the hospitalization of older adults generally involves not just themselves and their interactions with the formal health care system but can also impact the lives and life styles of significant others such as spouses, adult children, and their families.

Several current and projected demographic shifts provide an important backdrop for the potential aggregate impact of older adults on health care resources, the adequacy of their access to health care, as well as the nature and quality of health care they receive. First, as is the case nationally, Utah's older adult population has been increasing, both in number and percentage. The number of older adult Utahns expanded by nearly one-quarter from about 150,000 in 1990 to nearly 182,000 by 2000 (Cite Utah Office of Planning and Budget). By mid-2005 Utah's 65 and older population is projected to total 195,507 and to reach 275,196 by 2015 and 4482,542 by 2030(Utah Office of Planning and Budget). Thus, in the short span of 30 years (2000-2030), Utah's older adult population is projected to increase more than two and one-half fold.

Despite a more favorable life expectancy than the nation as a whole, Utah has lagged behind the nation in the percentage of its population in the older adult years, due to its relatively higher birth rate, supplemented by net immigration of young adults. Nevertheless, by 1990 8.7 percent of Utah's population was 65 years of age or older. Contributing to this population aging was a declining birth rate, expanding life expectancy, the increased size of cohorts entering the older adult years, and increasing older adult immigration, attracted by Utah's quality of life as well as legislative incentives built into the state tax code. Although diminishing slightly to 8.4 percent in 2000, the percentage of Utahns age 65 and over is projected to reach 9.3 percent in 2015 and 13.1 percent by 2030. Whereas in 2000 there were about 26 older adults aged 65 and over in Utah for every 100 children less than 18 years of age, by 2030, there would be 42 older adults for every 100 children less than 18.

A second major trend nationally and in Utah has been the aging of the older population itself. In 1990, there were 13,489 Utahns aged 85 and over, increasing by 60 percent to 19,569 in 2000 (Utah Office of Planning and Budget citation). The percentage of Utah's 65 and older population who were 85 and older has been steadily increasing since 1930. In 1930, 3.8 percent of Utah's older adult population was 85 years of age and older, doubling to 7.7 percent in 1970 (Stinner, Kwon and Baal, 1983:Table 4). By 1990, the percentage of older adult Utahns who were 85 years of age or over had increased to nine percent, expanding to 10.8 percent in 2000. Between 2000 and 2030 the 85 and older population is projected to more than double from 19,569 to 43,566. However, its share of the older adult population is projected to decline to 8.4 percent in 2025 and then increase to 9.0 percent by 2030, the level evident in 1990.

A third major development accompanying the aging of the general and older population during the 20th century in the nation and Utah has been the increasing relative concentration of women in the older adult and, especially, the oldest portion of the older adult population. At the beginning of the twentieth century there were about 98 Utah men age 65 and over and 86 men age 85 and over for every 100 women in each of those two age subgroups (Stinner, Kwon, and Baal, 1983: Table 5). A continuing decline ensued; thus, by 1990, there were 75 men age 65 and over and just 49 men age 85 and over for every 100 women in these respective age groups. Since 1990, a slight upward trend in the sex ratio for those 65 and over has been evident reaching 78 men per 100 women aged 65 and over, while the 85 and over sex ratio declined slightly to 48 men per 100 women. Between 2000 and 2030, the sex ratio for both the 65 and older and 85 and older population is projected to increase substantially. By 2030, there is projected to be 88 men aged 65 and older and 55 men aged 85 and older per 100 women in each of those two age groups.

In summary, during the past century Utah has witnessed a slow but increasing aging of its population. In particular, there has been an increasing number of older adults and a gradual increase in the proportionate representation of older adults in Utah's population. At the same time, Utah's older adult population has itself been aging as the number of persons in the oldest rungs of the older adult population has been increasing as has its share of the older adult population. Both the 65 and older and 85 and older populations are expected to increase substantially during the first three decades of this century. However, whereas the percentage 65 and older is also projected to increase during the same time period, the trend for the percentage of the 65 and older population in the oldest 85 and older age group is less consistent. At the same time, one expected countertrend is the expectation that men will become an increasing share of both the 65 and older and 85 and older population as opposed to the declining share evident historically. Barring major changes in the age-specific risks of hospitalization, overall and for specific diagnoses and procedures, increasing numbers of men would, under this scenario be exposed to the risks of hospitalization for those diagnoses and procedures showing a pattern of increasing propensity with age.

Given the above context, it is important to assess available data related to the hospitalization patterns, trends, and experiences of the older adult population. Unfortunately, only sketchy data on these matters is available for Utah (See, for example, Utah Office of Health Care Statistics, n.d.). This limited work, however, has shown some important differences within the older adult population as well as between the older and younger portions of Utah's population and between Utah's older adults and their counterparts nationally in hospitalization utilization and experience patterns. This report, therefore, contributes to a fuller exploration of this important topic, touched only lightly in previous work. The report analyzes discharge data for Utah's older adult population age 65 and over for the period 1996-1998 as well as trend data from 1992 to 1998. Where possible, Utah data are supplemented with data from the most recent data (1998) from the National Hospital Discharge Survey (See Popovic and Kozak, 2000). The specific aims of the study are as follows:

1. To document, for the total population 65 years of age and older and by gender and three age subgroups (65-74, 75-84, and 85 and over) as well as age-gender combinations those primary or first-listed diagnoses and procedures with the highest volume and rates (per 10,000 population) for the three-year period between 1996 and 1998 as well as trend data from 1992 to 1998.

2. To document overall and for those subgroups and primary or first-listed diagnoses and procedures, mean length of stay, hospital charges (total, mean, and per capita), discharge status, in-hospital mortality and payer sources for the 1996-1998 period as well as trend data from 1992 to 1998 for several of these indicators.
3. To analyze discharge status by age and gender between 1996 and 1998.
4. To report the payment source for those most frequent diagnoses and procedures during the 3-year period from 1996 to 1998.

DATA AND PROCEDURES

The data source for this investigation was the Utah Hospital Inpatient Discharge Data file covering the years 1992 through 1998 (For a description of this data file see “Public use data file users manual - Inpatient” at <http://hlunix.hl.state.ut.us/hda/dataproducts.htm>). The study is restricted to discharges of Utah residents aged 65 and older, whom we refer to as the “older adult” population. Discharges involving persons who resided outside Utah at the time of admission are eliminated from the analysis. Population estimates used as denominators for rate computation were provided by the Utah Governor’s Office of Planning and Budget.

Definition of Discharge Conditions and Procedure:

Hospital discharge data uses International Classification of Diseases, Clinical Modification (ICD-9-CM), ninth revision to classify the diagnoses and procedures for which people are hospitalized. This report uses a classification scheme developed by the Agency for Health Care Policy and Research (AHCPR) (now Agency for Health Care Research and Quality –AHRQ) to aggregate ICD-9 diagnoses and procedures into clinically homogenous, more manageable number of categories. This classification scheme is created by a program called **Clinical Classification Software (CCS)**. The definition of CCS categories based on ICD-9-CM diagnosis and procedure codes, can be found at: <http://www.ahrq.gov/data/hcup/ccs.htm>. Conversion tables for the diagnoses and procedures used in this report are provided in APPENDIX A and B, respectively.

Ranking Most Frequent Diagnoses and Procedures

Most of the analyses are based on those 10 primary or first-listed diagnoses and procedures (including subsets thereof), respectively, which had the highest volume during a three-year period from 1996-98 overall, for men and women, and for three age groups, namely, 65-74, 75-84, and 85 and over. Thus, it is important to recognize that all rankings begin from the initial ranking based on volume and rate (Rankings on volume and rate are similar.). For example, when we speak of relative ranking of diagnoses or procedures on length of stay or mean charges or percentage dying in the hospital we are referring to those 10 diagnoses or procedures with the highest volume and not all diagnoses or procedures. Thus, the eligibility pool is restricted to the 10 diagnoses or procedures initially selected on the basis of having the topmost numbers and rates. Were we to have done the rankings based on an eligibility pool of all discharges, other diagnoses or procedures may have been selected and included in the subsequent rankings. However, by restricting the analysis to just the highest volume diagnoses and procedures we gain further confidence in the data. Some variations on these topmost diagnoses and procedures are evident in the case of gender and age differentials. In other words, differences in the specific diagnoses and procedures within the top ten listing, in terms of numbers and rates, are evident between men and women and across three age groups(65-74, 75-84, and 85 and over). ¹

For 1992-98 trend analyses as well as age and gender analyses, the report focuses on a smaller subset of the ten most frequent primary diagnoses and procedures. A set of complete tables can be found at:

<http://hlunix.hl.state.ut.us/hda/technicalpublications.htm>

Measures

In these analyses, the measures include numbers, rates, mean length of stay, total, mean, and per capita charges, and in-hospital mortality and payer distributions. Rates are reported per 10,000 population. Mean length of stay is computed by taking the total number of days and dividing by the total number of discharges(minus those discharges missing data on number of days). Financial charges represent the amount billed and not necessarily costs. Total charges refer to the total amount billed. Mean charges are computed by dividing the total charges by the number of discharges (minus those discharges missing data on financial discharges). In-hospital mortality was measured by the percent of discharges which involved a death during the hospital stay. Payer distributions are based on the actual entity billed for the hospitalization or the primary payer.

RESULTS

NUMBER OF DISCHARGES AND TOTAL HOSPITAL CHARGES (1996-98) (TABLE 1)

- A total of 142,388 older adults were discharged from Utah hospitals between 1996 and 1998 or nearly one-quarter of all discharges during that three year period. National Hospital Discharge Survey data for 1998 revealed that two of five discharges were older adults, nearly double Utah's percentage (Popovic and Kozak, 2000: Table 1).
- About one-fifth of female discharges were 65 and over (75,839) compared to over 27 percent of male discharges (66,569).
- Older adult Utahns' hospital charges exceeded \$1.5 billion or 34 percent of all hospital charges between 1996 and 1998.
- Women age 65 and over accounted for 32.5 percent of women's total hospital charges. Older adult men accounted for 35.5 percent of men's total hospital charges.

Table 1. Number of Discharges and Total Hospital Charges by Age and Gender and Percentage of Discharges and Total Hospital Charges 65 and Over: 1996-98

Gender and Age	Number of Discharges	Total Hospital Charges
Total	631,346	\$4,455,345,980
Under 65	488,958	\$2,943,335,906
65 and over	142,388	\$1,512,010,074
% 65 and over	22.6%	34.0%
Females	388,834	\$2,415,422,298
Under 65	312,995	\$1,629,539,832
65 and over	75,839	\$ 785,882,466
% 65 and over	19.5%	32.5%
Males	242,503	\$2,039,765,158
Under 65	175,934	\$1,314,679,964
65 and over	66,569	\$ 725,085,194
% 65 and over	27.5%	35.5%

Source: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

SELECTED HOSPITALIZATION INDICATORS (1996-98)
TOTAL, UNDER 65, 65 AND OVER
(TABLE 2)

Hospital Discharge Rate

- Whereas the number of discharges under 65 was more than triple that among those 65 and over, the hospital discharge rate among those 65 and over was more than double that of those under 65 (2653.7 vs. 1105.3 discharges per 10,000 population).
- The hospital discharge rate (per 10,000 population) between 1996 and 1998 for older adult Utahns (2856.3) was below that of older adults in the nation, observed in the 1998 National Hospital Discharge Survey (3,652.7) (Popovic and Kozak, 2000: Table 1).
- The hospital discharge rate among females 65 and over was quadruple that of females under 65 (2498.7 vs. 632.4). The rate among men aged 65 and over was 2.6 times that of their counterparts under 65 (2856.5 vs. 1105.3).

Mean Length of Stay (In Days)

- Overall, the mean length of stay for those 65 and over was 1.6 times that of those under 65 (5.2 vs. 3.3 days). The mean length of stay between 1996 and 1998 for older adult Utahns (5.2 days) was below that of older adults in the nation, observed in the 1998 National Hospital Discharge Survey (Popovic and Kozak, 2000: Table 1).
- The mean length of stay among women 65 and over was 1.8 times that of women less than 65 (5.1 vs. 2.9 days). Among men, the 65 and over length of stay was 1.3 times that of men less than 65 (5.3 vs. 4.0 days).

Mean Hospital Charges

- Overall, mean hospital charges among those 65 and over were 1.8 times the under 65 charges (\$11,206 vs. \$6,121).
- The mean hospital charges among women 65 and over were twice those of their counterparts less than 65 (\$10,454 vs. \$5,223). Mean hospital charges among men 65 and over were 1.6 times charges for men less than 65 (\$12,154 vs. \$7,779).

In-Hospital Mortality

- Overall, 4.3 percent of older adult discharges (N = 6,166) had died in the hospital compared to 0.6 percent of discharges under 65 (N = 2,716), more than a seven fold difference. Data from the 1998 National Hospital Discharge Survey showed an in-hospital mortality rate of 4.9 percent among those 65 and over compared to 1.1 percent among those less than 65 years of age (Popovic and Kozak, 2000: Table 4).
- Women 65 and over were 10 times more likely to die in the hospital than women under 65 (4.0 vs. 0.4 percent). Men 65 and over were more than five times more likely than their counterparts under 65 to die in the hospital (4.7 vs. 0.9).

Table 2. Hospital Discharge Rate (Per 10,000 Population), Mean Length of Stay (In Days), Mean Hospital Charges, and Percentage Who Died in the Hospital by Age and Gender: All Hospital Discharges: 1996-98

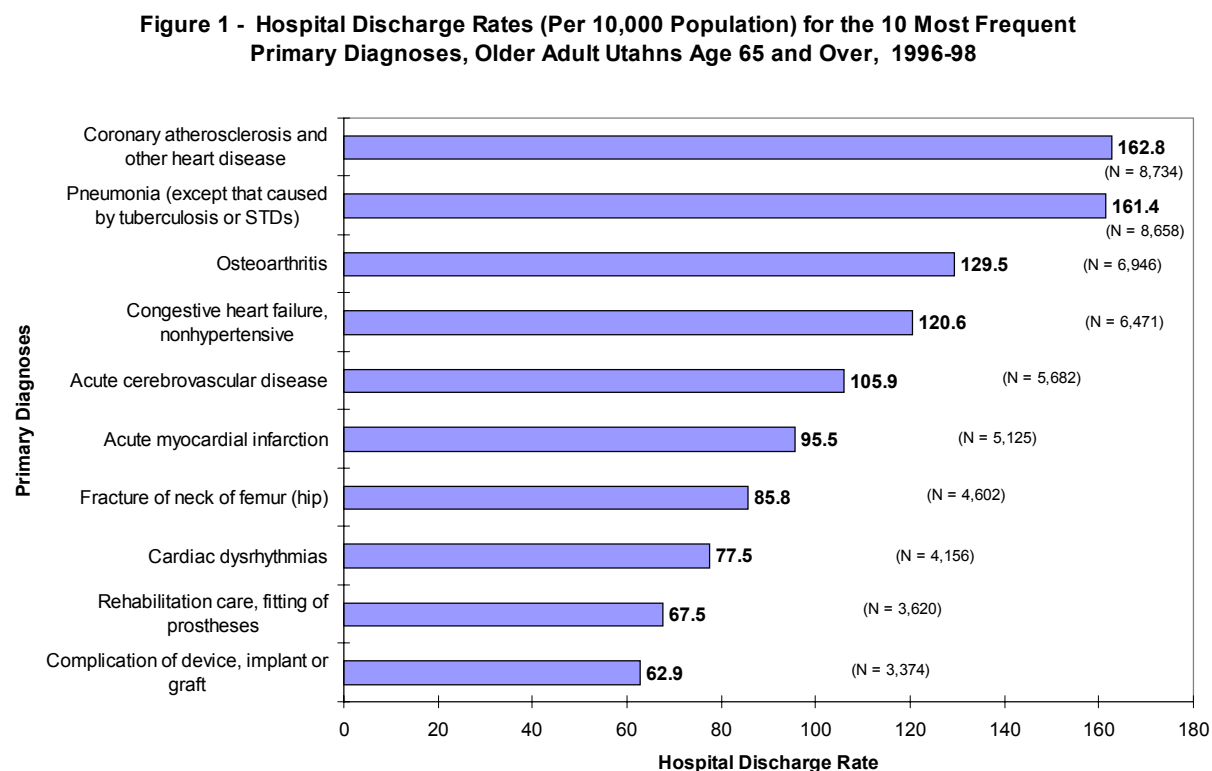
Gender and Age	Hospital Discharge Rate	Mean Length of Stay (In Days)	Mean Charges	Percentage Died in Hospital
Total	1026.5	3.7	\$ 7,230	1.4 %
Under 65	1105.3	3.3	\$ 6,121	0.6 %
65 and over	2653.7	5.2	\$11,206	4.3 %
Ratio: 65+/Under 65	2.40	1.58	1.83	7.27
Females	785.9	3.3	\$ 6,235	1.1 %
Under 65	632.4	2.9	\$ 5,223	0.4 %
65 and over	2498.7	5.1	\$10,454	4.0 %
Ratio: 65+/Under 65	3.95	1.76	2.00	10.00
Males	1268.6	4.4	\$ 8,916	2.0 %
Under 65	1105.3	4.0	\$ 7,779	0.9 %
65 and over	2856.5	5.3	\$12,154	4.7 %
Ratio: 65+/Under 65	2.58	1.33	1.56	5.22

Source: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

SELECTED HOSPITALIZATION INDICATORS MOST FREQUENT PRIMARY DIAGNOSES (1996-98)

Hospitalization Rates and Numbers (Figure 1)

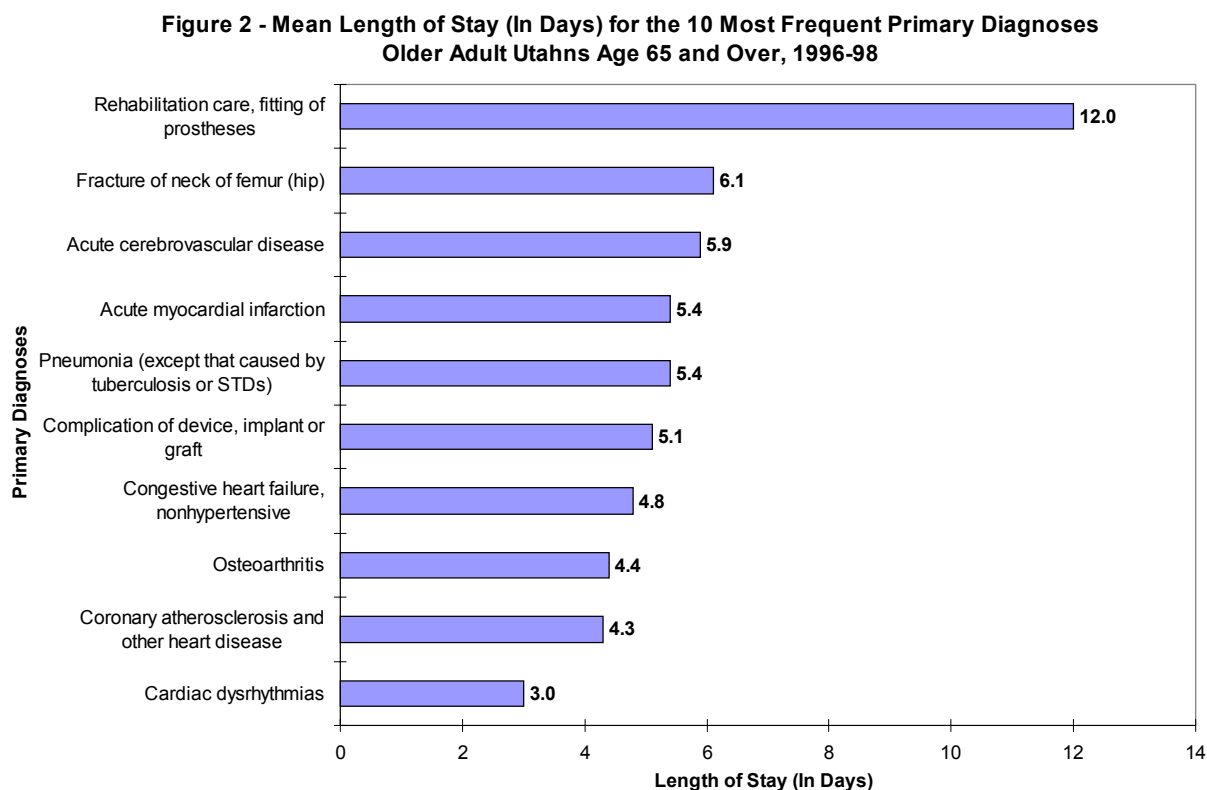
- The ten most frequent primary diagnoses comprised a total of 57,368 discharges, accounting for 38 percent of all hospital discharges involving older adults between 1996 and 1998.
- Coronary atherosclerosis and other heart disease and pneumonia had discharge rates exceeding 161 per 10,000 population, involving more than 8,600 discharges each.



SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

Mean Length of Stay (In Days) (Figure 2)

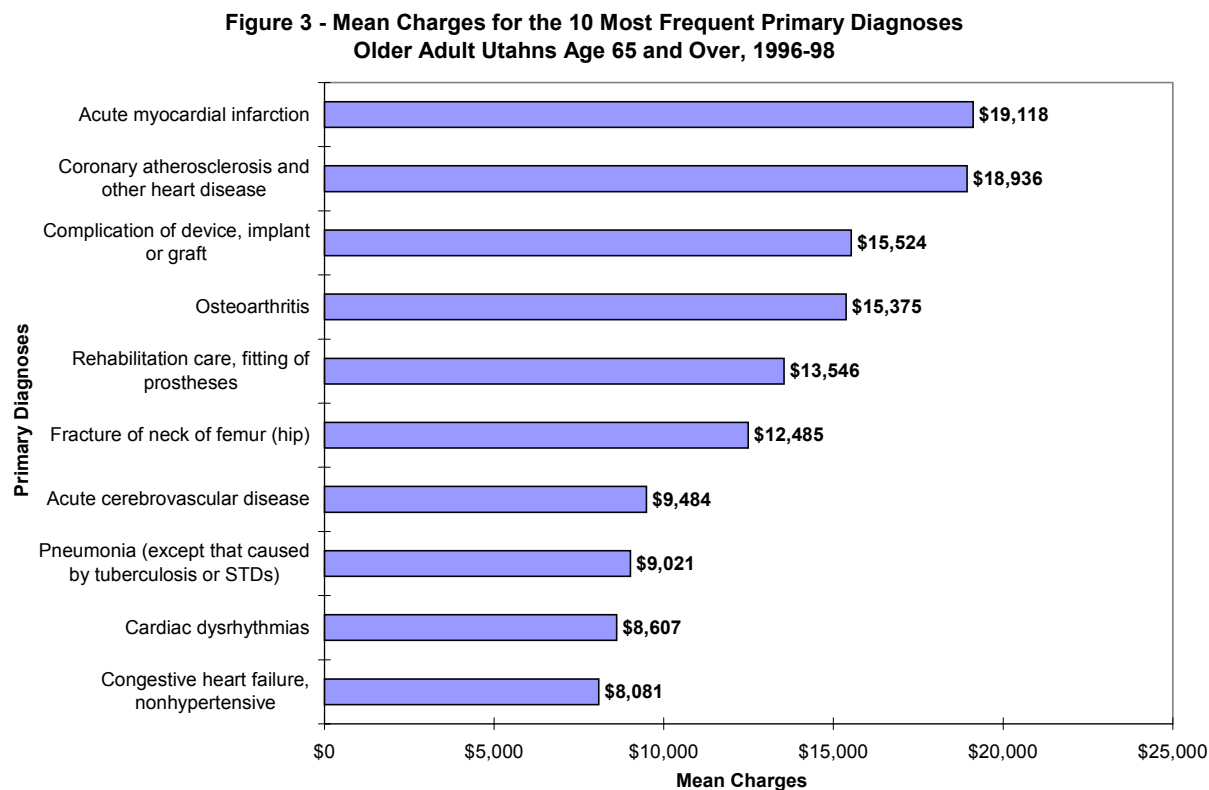
- Rehabilitation care/fitting of prostheses had the longest average stay among the ten most frequent primary diagnoses (12 days).
- The next five primary diagnoses in order of length of stay had average stays of 5-6 days.



SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

Mean Hospital Charges (Figure 3)

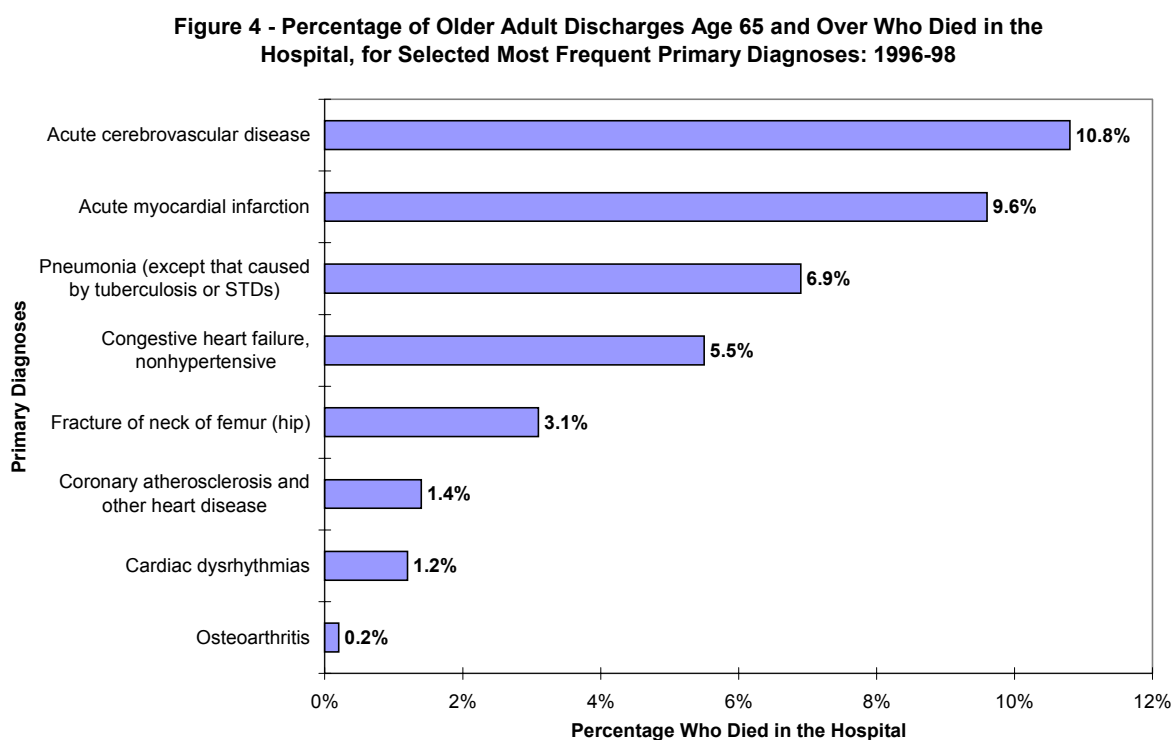
- The four primary diagnoses with the highest mean hospital charges among the top ten were acute myocardial infarction (\$19,118), coronary atherosclerosis and other heart disease (\$18,936), complication of device, implant, or graft (\$15,524), and osteoarthritis (\$15,375).



SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah State Department of Health.

In-Hospital Mortality (Figure 4)

- Discharges with a primary diagnosis of acute cerebrovascular disease, acute myocardial infarction, pneumonia, or congestive heart failure had the highest in-hospital mortality rates.
- In about one out of 10 or 11 discharges with a primary diagnosis of acute myocardial infarction or acute cerebrovascular disease, one out of 14 with pneumonia, and about one in 18 with congestive heart failure the patient died in the hospital.



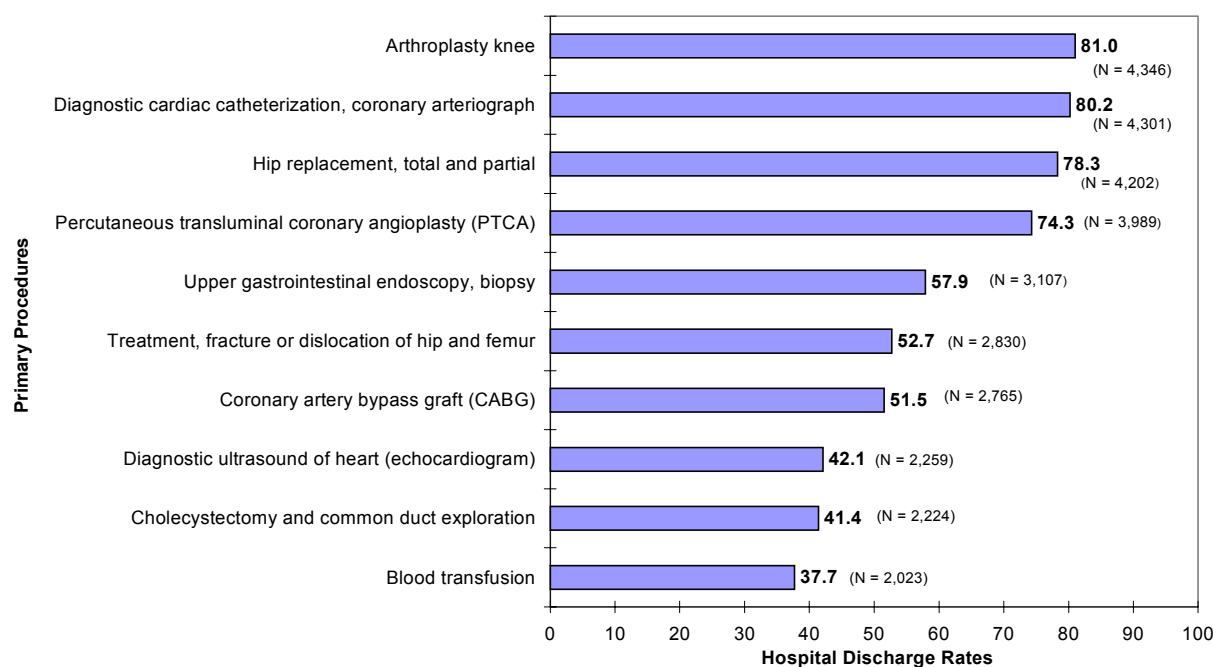
SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

SELECTED HOSPITALIZATION INDICATORS MOST FREQUENT PRIMARY PROCEDURES (1996-98)

Hospitalization Rates and Numbers (Figure 5)

- A total of 88,870 discharges between 1996 and 1998 or 62.4 percent of all older adult discharges involved a procedure, of which 32,046 or 36.1 percent involved one of the ten most frequent procedures.
- Knee arthroplasty, diagnostic cardiac catheterization/coronary arteriography, total or partial hip replacement, and percutaneous transluminal coronary angioplasty (PTCA) had rates exceeding 74 per 10,000 persons involving about 4,000 or more discharges each.

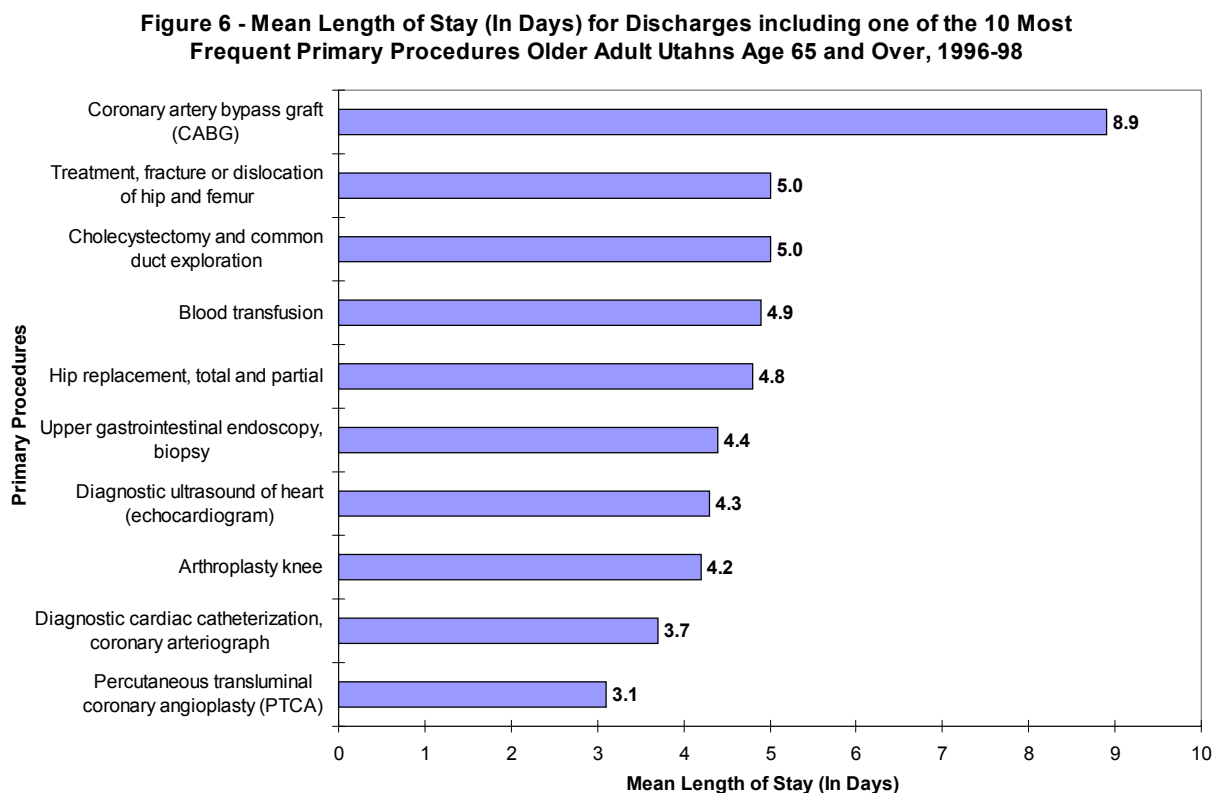
Figure 5 - Hospital Discharge Rates (Per 10,000 Population) for the 10 Most Frequent Primary Procedures, Older Adult Utahns Age 65 and Over, 1996-98



SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

Mean Length of Stay (In Days) (Figure 6)

- Discharges for CABG surgery had the longest average stay among hospitalization that included the most frequent primary procedures (8.9 days).
- Discharges that included the next seven most frequent primary procedures had average stays of 4-5 days.

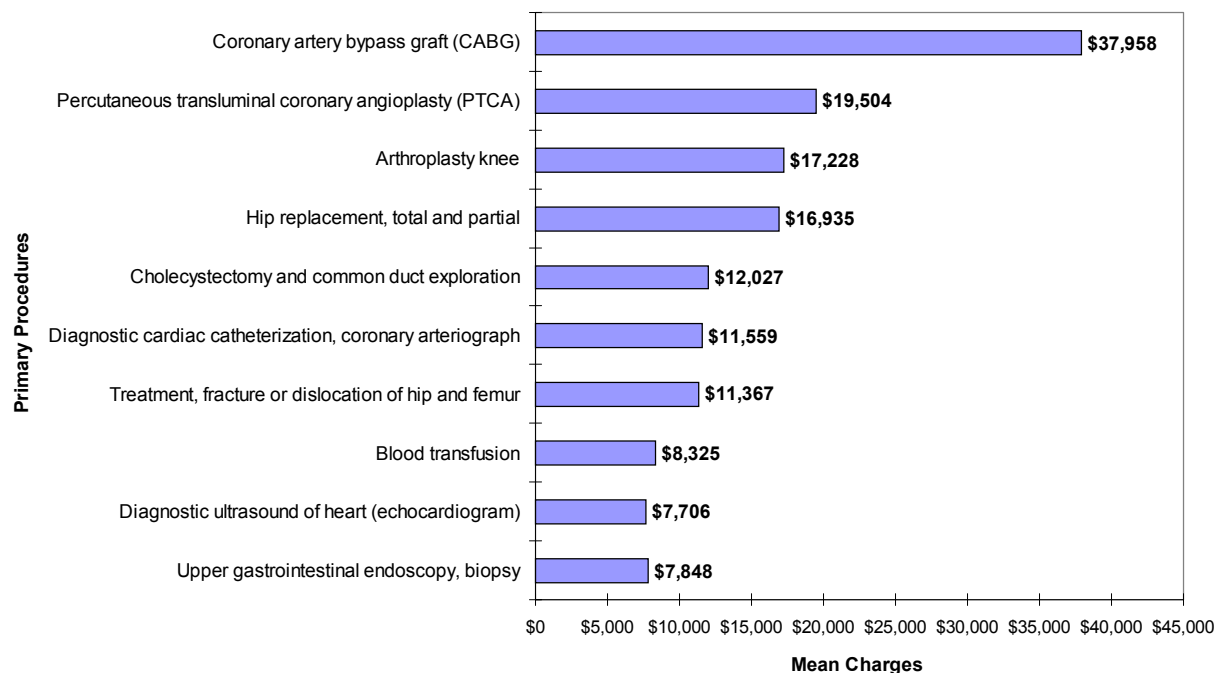


SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah. Department of Health.

Mean Charges (Figure 7)

- Discharges involving coronary artery bypass graft (CABG) had the mean charges of \$37,958.
- The average hospital charge for a discharge involving CABG was nearly double that for a discharge involving PTCA(\$19,504), and more than double that for discharges involving knee arthroplasty (\$17,228) or partial hip replacement (\$16,935).

**Figure 7 - Mean Charges for the 10 Most Frequent Primary Procedures
Older Adult Utahns Age 65 and Over, 1996-98**

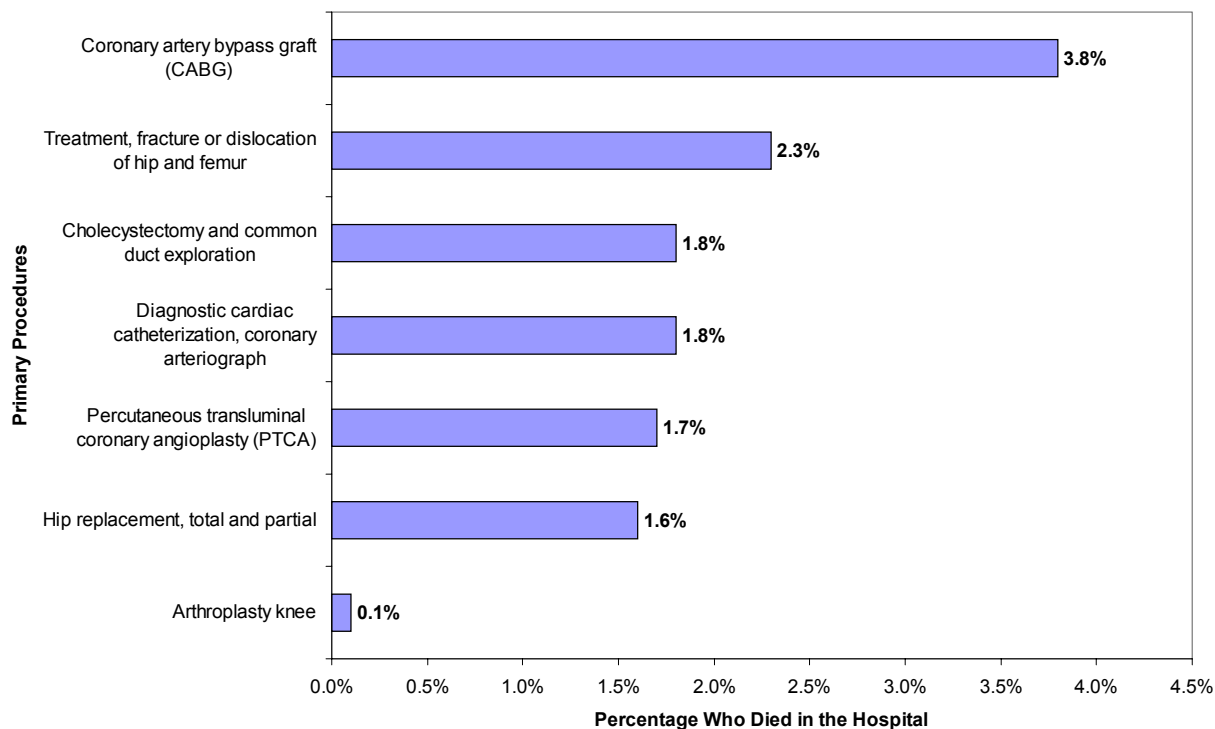


SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

In-Hospital Mortality (Figure 8)

- Discharges where either CABG surgery or treatment for hip/femur fracture or dislocation was the primary procedure had the highest in-hospital mortality rates.
- One out of about 25 discharges where CABG surgery was the primary procedure and about one in 43 where hip fracture/dislocation treatment was the primary procedure involved an in- hospital death.

Figure 8 - Percentage of Older Adult Discharges Age 65 and Over Who Died in the Hospital, for Selected Most Frequent Primary Procedures: 1996-1998



SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**SELECTED HOSPITALIZATION INDICATORS
OVERALL ANNUAL TREND (1992-98)
(TABLE 3)**

Hospital Discharges: Numbers and Rates (Per 10,000 Population)

- There were over 305,000 hospital discharges involving older adults between 1992 and 1998. The number of annual discharges increased from 37,894 in 1992 to 48,312 in 1998, an increase of 10,418 or 27.5 percent.
- There were over 6,000 more discharges in 1995 than in 1992 and over 4,000 more discharges in 1998 than in 1995.
- The hospital discharge rate increased steadily from 2381.0 per 10,000 population in 1992 to 2690.3 in 1997, declining slightly to 2650.4 in 1998. Nationally, older adult discharge rates slowly but steadily increased during the same time period (Kramerow et al., 1999: Table 90; Popovic and Kozak, 2000: Table 1).

Mean Length of Stay (In Days)

- The mean length of stay for hospitalizations of Older adult Utahns declined from 6.5 days in 1992 to 5.2 days in 1996 (-20 percent) and remained at that level through 1998. National average length of stay consistently declined from 8.2 days in 1992 to 6.2 days in 1998, a full two-day drop (Kramerow et al., 1999: Table 90; Popovic and Kozak, 2000: Table 1) compared to Utah's 1.3 day drop.

Mean Hospital Charges

- Mean hospital charges steadily increased from \$9,552 in 1992 to \$11,826 in 1998, an increase of \$2,274 or 23.8 percent.
- Mean hospital charges increased by \$865 or 9.1 percent between 1992 and 1995 and by \$1,409 or 13.5 percent between 1995 and 1998.

In-Hospital Mortality

- There was only minimal annual variation in in-hospital mortality between 1992 and 1998. Roughly, about one in 20 to 25 discharges in each year involved an in-hospital death

Table 3. Overall Annual Trend (1992-1998) in Number and Rate (Per 10,000 Population) of Hospital Discharges, Mean Length of Stay (In Days), Mean Hospital Charges, and Percentage Who Died in the Hospital: All Discharges For Older Adults Age 65 and Over

Selected Indicators	Years							Percent Change (1992-98)
	1992	1993	1994	1995	1996	1997	1998	
Number of discharges	37,894	39,941	41,214	44,072	45,994	48,082	48,312	+27.5 %
Discharge rate	2,381.0	2446.0	2460.5	2569.2	2620.0	2690.3	2650.4	+11.3 %
Mean length of stay (In days)	6.5	6.6	6.4	5.9	5.2	5.2	5.2	-20.0 %
Mean hospital charges	\$9,552	\$9,674	\$10,177	\$10,417	\$10,580	\$11,190	\$11,826	+23.8 %
Percentage who died in the hospital	4.4	4.8	4.4	4.3	4.3	4.4	4.3	-2.3 %

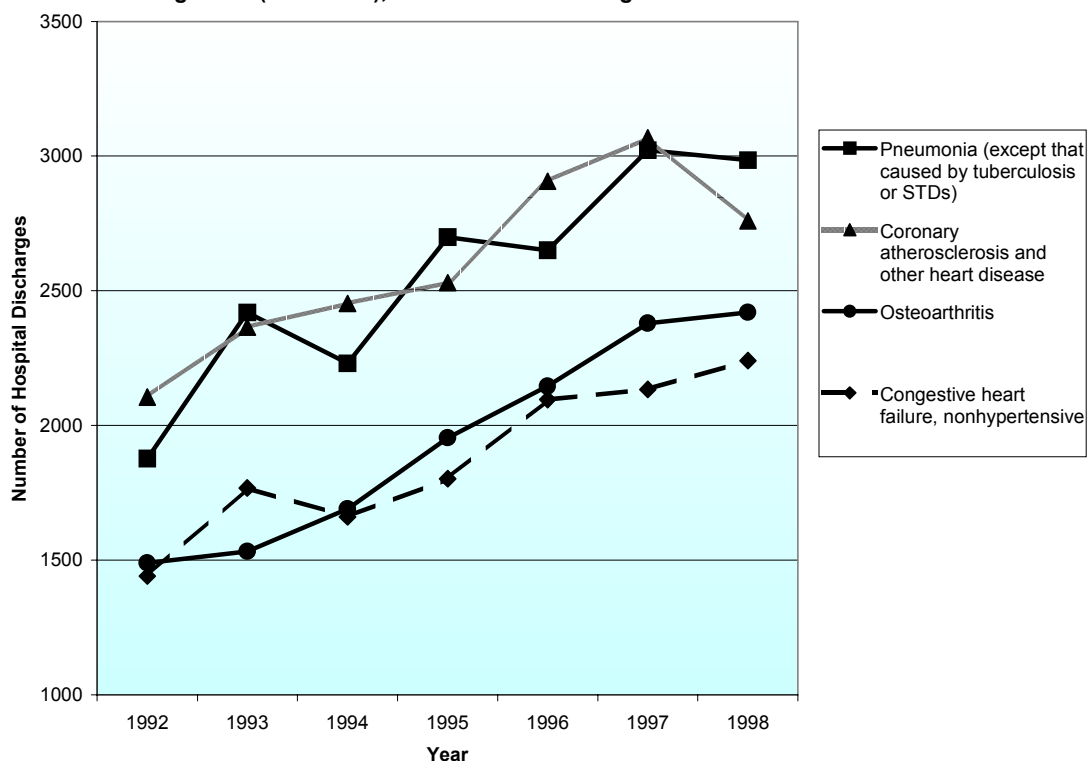
Source: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

ANNUAL TREND (1992-98) IN HOSPITAL DISCHARGE NUMBERS AND RATES MOST FREQUENT PRIMARY DIAGNOSES (1996-98)

Hospital Discharge Numbers (Figure 9)

- The annual number of discharges with a diagnosis of osteoarthritis consistently increased from 1,489 in 1992 to 2,420 in 1998, an increase of nearly 1,000 or 62.5 percent. Congestive heart failure annual discharges increased steadily since 1994.
- Coronary atherosclerosis and other heart disease discharges increased steadily from 2,105 in 1992 to 3,068 in 1997, dipping to 2,759 in 1998.
- The number of discharges with a primary diagnosis of pneumonia tended to oscillate over time. However, the number in 1998 was more than one-third higher than in 1992 (2,985 vs. 1,877).

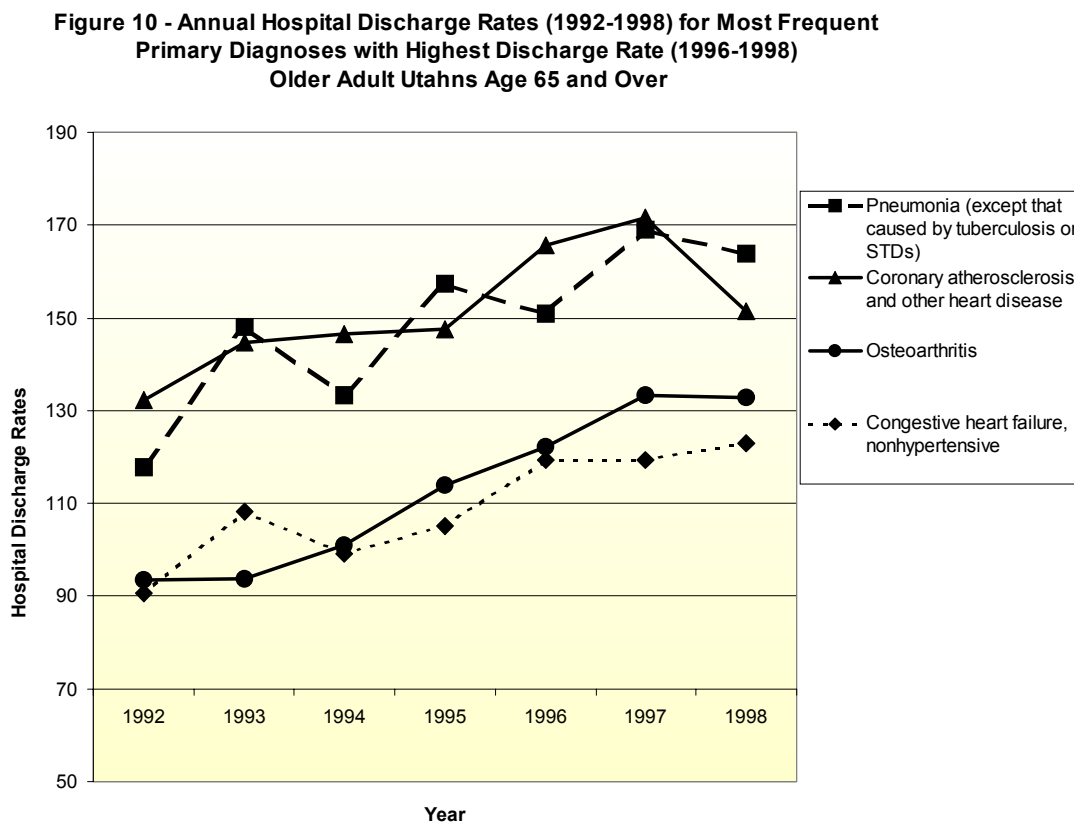
Figure 9 - Annual Number of Hospital Discharges (1992-1998) for Most Frequent Primary Diagnoses (1996-1998), Older Adult Utahns Age 65 and Over



SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

Hospital Discharge Rates (Figure 10)

- Annual discharge rates for coronary atherosclerosis and other heart disease and osteoarthritis increased steadily between 1992 and 1997. Between 1997 and 1998 the rate declined for coronary atherosclerosis and leveled off for osteoarthritis.
- Annual discharge rates for pneumonia fluctuated erratically between 1992 and 1998 while rates for congestive heart failure tended to increase after 1994.



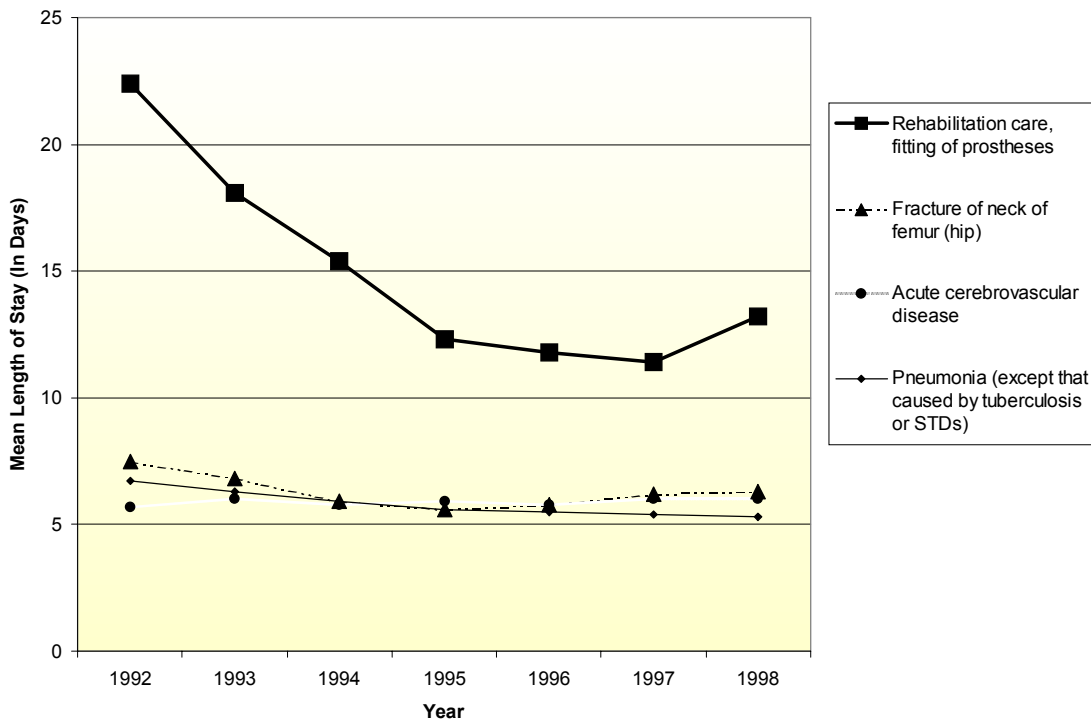
SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

ANNUAL TREND (1992-98) IN SELECTED HOSPITALIZATION INDICATORS LEADING PRIMARY DIAGNOSES FOR INDICATOR (1996-98)

Mean Length of Stay (In Days) (Figure 11)

- The mean length of stay was lower in 1998 than in 1992 for three of the four primary diagnoses with the longest average stay between 1996 and 1998.
- The average stay for rehabilitation care/prostheses fitting declined by one-half between 1992 and 1997 (11.4 vs. 22.4 days) and then increased by 1.8 days in 1998.
- The mean length of stay for pneumonia dropped consistently between 1992 and 1998; however, the rate of decline in the latter half of the period was lower than in the first half.
- The average stay for fracture of neck of femur (hip) decreased steadily from 7.5 days in 1992 to 5.6 days in 1995, but then increased steadily, to 6.3 days in 1998.
- The average stay for acute cerebrovascular disease fluctuated erratically within a narrow range across the years. The average stay in 1998 was actually .3 day higher than in 1992 (6.0 vs. 5.7 days).

Figure 11 - Annual Mean Length of Stay (In Days) (1992-1998) for Longest of Most Frequent Primary Diagnoses (1996-1998), Older Adult Utahns Age 65 and Over

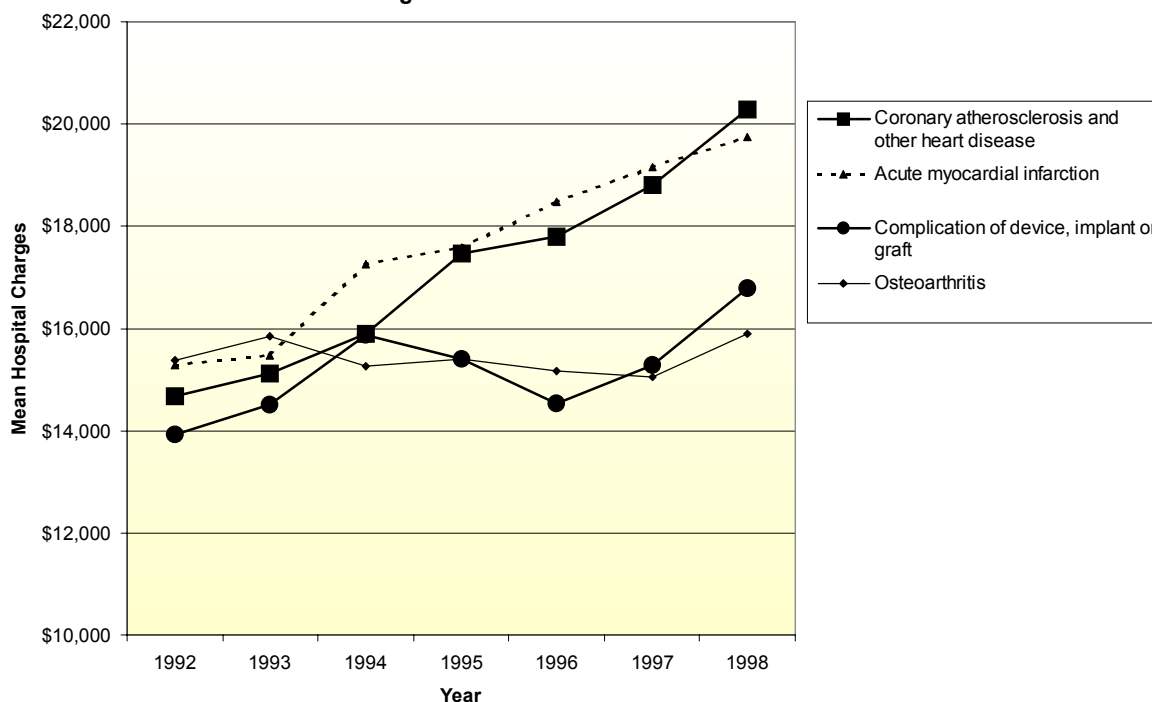


SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

Mean Hospital Charges (Figure 12)

- For each of the four primary diagnoses with the highest average hospital charges between 1996 and 1998, mean hospital charges were higher in 1998 than in 1992.
- Mean hospital charges for coronary atherosclerosis and other heart disease and acute myocardial infarction consistently increased in each year between 1992 and 1998.
- Average hospital charges for device, implant, or graft complications increased between 1992 and 1994, declined between 1994 and 1996, and then increased again by over \$2,200 between 1996 and 1998.
- Average hospital charges for osteoarthritis fluctuated erratically within a narrow range across the years.

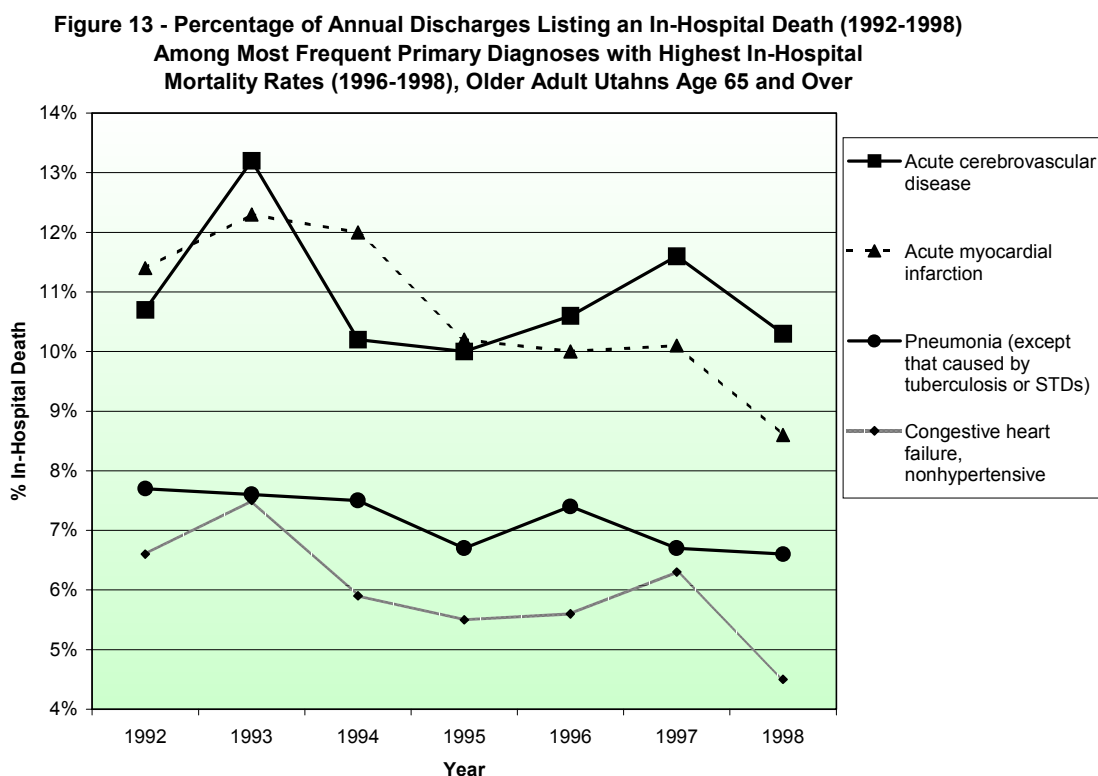
Figure 12 - Annual Mean Hospital Charges (1992-1998) for Most Frequent Primary Diagnoses with Highest Hospital Charges Between 1996 and 1998, Older Adult Utahns Age 65 and Over



SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

In-Hospital Mortality (Figure 13)

- Across primary diagnoses, inter-annual change in the percentage of discharges involving an in-hospital death tended to be slight and erratic.
- Those discharges with a primary diagnosis of either acute myocardial infarction or acute cerebrovascular disease consistently showed the highest rate of in-hospital mortality over time followed by those discharges with a primary diagnosis of pneumonia and congestive heart failure.



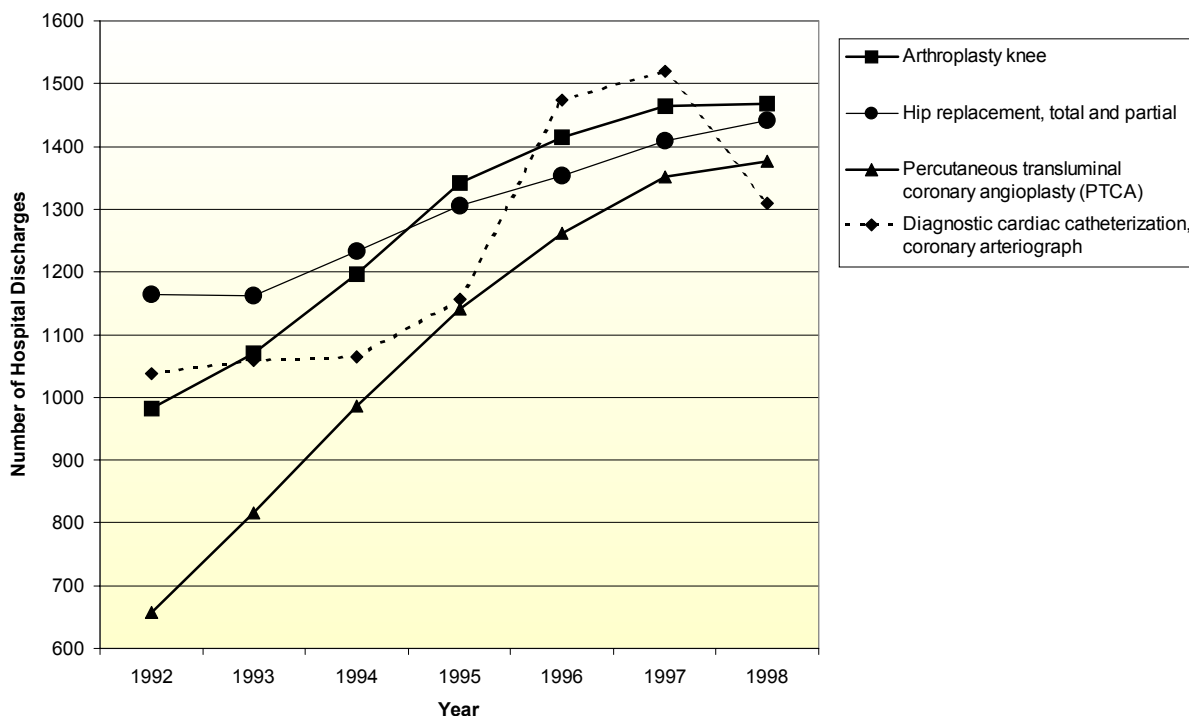
SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

ANNUAL TREND (1992-98) IN HOSPITAL DISCHARGE NUMBERS AND RATES MOST FREQUENT PRIMARY PROCEDURES (1996-98)

Hospital Discharge Numbers (Figure 14)

- For each of the four most common procedures between 1996 and 1998 the number of procedures in 1998 was greater than in 1992.
- The annual number of knee arthroplasty and PTCA procedures expanded steadily in each year between 1992 and 1998 with the greatest expansion occurring during the first half of the time series.
- The annual number of PTCA procedures more than doubled from 657 in 1992 to 1,376 in 1998 with the major increment occurring between 1992-1995.
- The annual number of total or partial hip replacement surgeries increased continuously between 1993 and 1998.
- The yearly number of diagnostic cardiac catheterization procedures increased slowly from 1,037 in 1992 to 1,065 in 1994, then accelerated, reaching 1,519 in 1997, followed by a dip in 1998.

Figure 14 - Annual Number of Hospital Discharges (1992-1998) for Most Frequent Primary Procedures (1996-1998), Older Adult Utahns Age 65 and Over

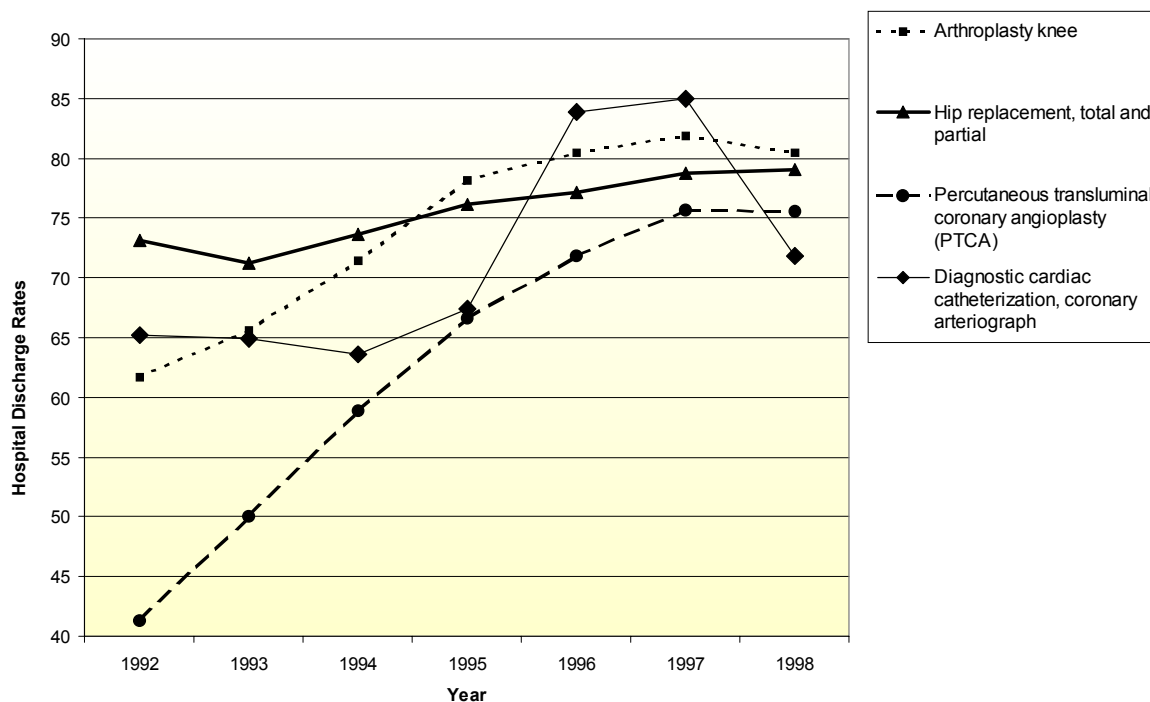


SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

Hospital Discharge Rates (Figure 15)

- The discharge rates for knee arthroplasty and PTCA increased continuously from 1992 to 1997 and then leveled off.
- The rates for hip replacement surgery increased slowly, but steadily, between 1993 and 1998.
- The rates for diagnostic cardiac catheterization declined slightly between 1992 and 1994 and then increased dramatically each year up to 1997, but then dropped in 1998.

Figure 15 - Annual Hospital Discharge Rates (1992-1998) for Most Frequent Primary Procedures with Highest Discharge Rate (1996-1998) Older Adult Utahns Age 65 and Over



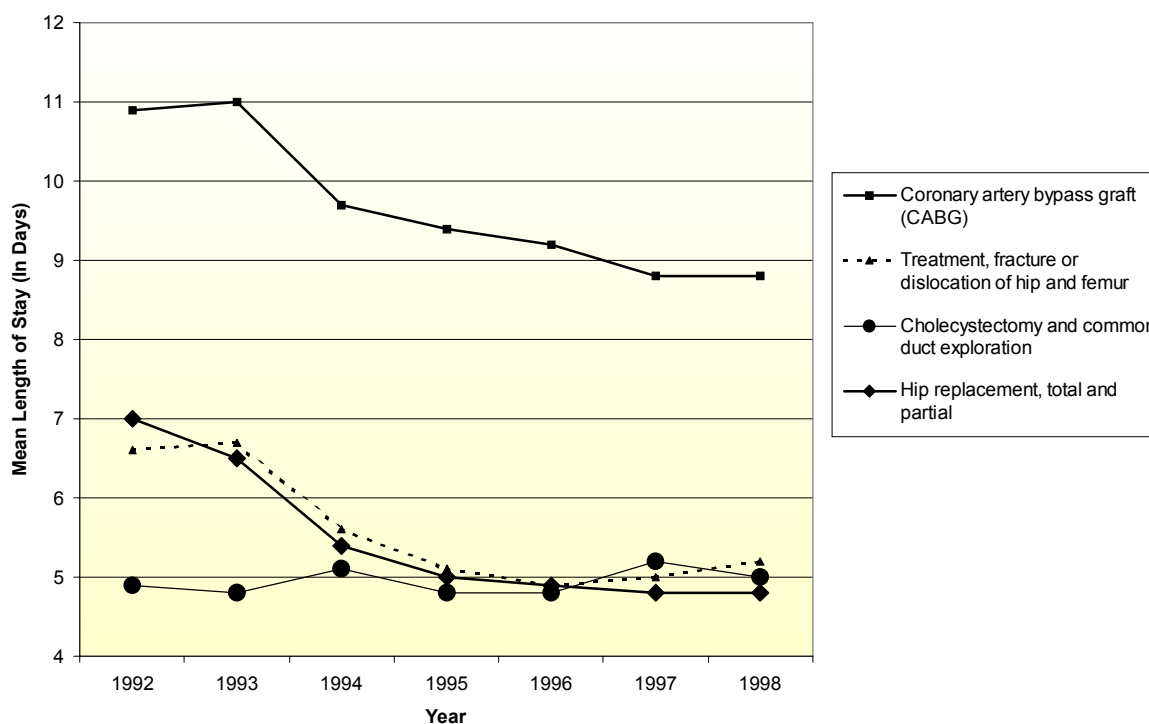
SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

ANNUAL TREND (1992-98) IN SELECTED HOSPITALIZATION INDICATORS LEADING PRIMARY PROCEDURES FOR INDICATOR (1996-98)

Length of Stay (Figure 16)

- The length of stay for three of the four primary procedures having the longest average stay between 1996 and 1998 was lower in 1998 than in 1992 with a difference of 2.2 days for CABG surgery.
- The average length of stay for CABG surgery steadily declined between 1993 and 1997 and then leveled off in 1998.
- The average length of stay for total or partial hip replacement surgery and treatment for fracture/dislocation of femur and hip dropped substantially between 1993 and 1995 and then leveled off.
- The mean stay for cholecystectomy and common duct exploration fluctuated between 4.8 and 5.2 days across the years.

Figure 16 - Annual Mean Length of Stay (In Days) (1992-1998) for Longest of Most Frequent Primary Procedures (1996-1998), Older Adult Utahns Age 65 and Over

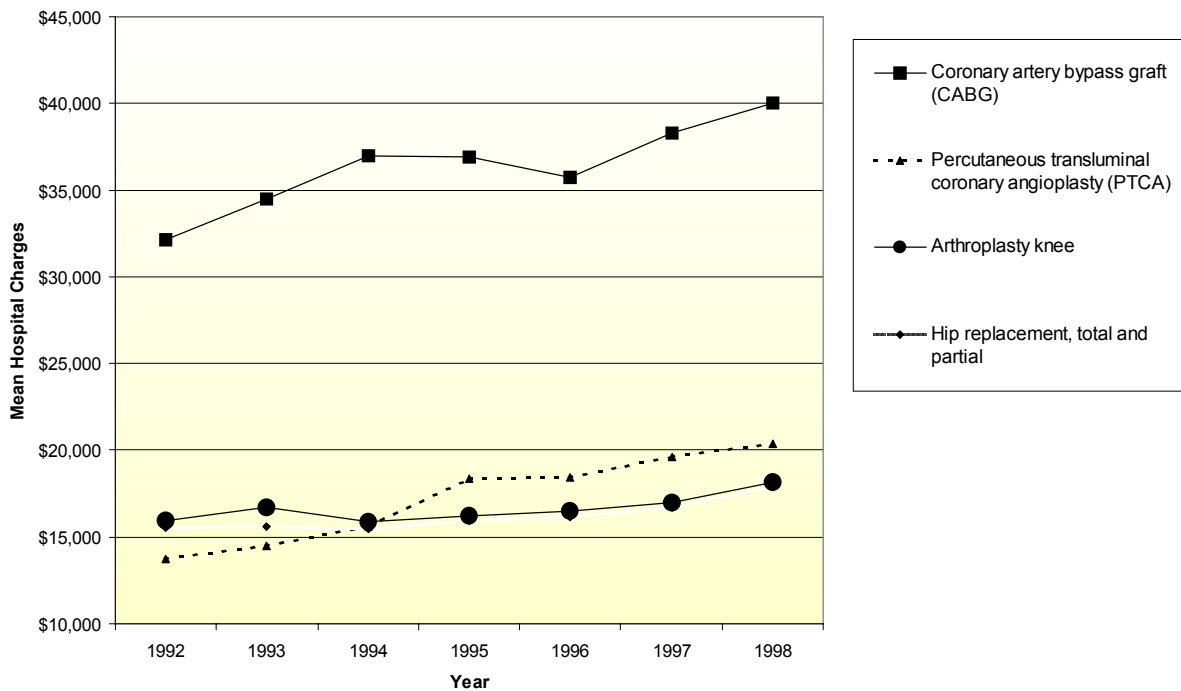


SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

Mean Hospital Charges (Figure 17)

- Mean hospital charges in 1998 were higher than in 1992 for each of the four primary procedures with the highest charges during the 1996-98 period.
- Mean hospital charges for discharges with PTCA as the primary procedure increased in each succeeding year between 1992 and 1998. They were \$6,649 higher in 1998 than in 1992 (\$20,377 vs. \$13,728), an increase of 48.4 percent or about eight percent per annum.
- Average hospital charges in 1998 for discharges with CABG surgery as the primary procedure were nearly \$8,000 more than in 1992, an increase of about one-quarter or about four percent per annum.
- Mean charges with hip replacement surgery or knee arthroplasty listed as the primary procedure increased slowly, but steadily between 1994 and 1998, with an overall increase of over \$2,300 each.

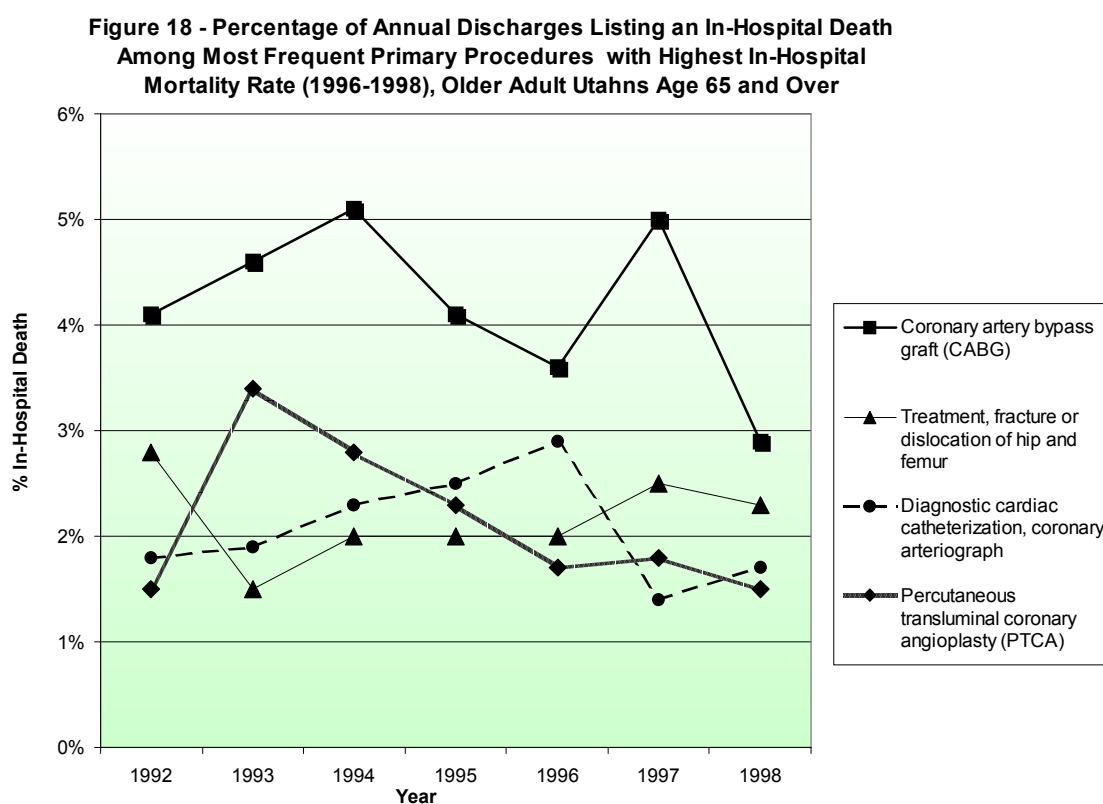
Figure 17 - Annual Mean Hospital Charges (1992-1998) for Most Expensive of Most Frequent Primary Procedures with Highest Mean Hospital Charges Between 1996 and 1998, Older Adult Utahns Age 65 and Over



SOURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

In-Hospital Mortality (Figure 18)

- In-hospital mortality tended to fluctuate over time for each of the charted primary procedures.
- Those discharges with CABG and treatment of hip/femur fracture or dislocation listed as the primary procedures showed the highest rates of in-hospital mortality in 1992 (4.1 and 2.8 percent, respectively). Although rates slightly declined for both procedures between 1992 and 1998, the two procedures still exhibited the top rates in 1998 (2.9 and 2.3 percent, respectively).
- Rates of in-hospital mortality for PTCA, following an initial rise between 1992 and 1993, subsequently trended downward.



OURCE: Utah Inpatient Hospital Discharge Database, 1992-98, Utah Department of Health.

**HOSPITALIZATION RATES:
GENDER-AGE DISCHARGE DISTRIBUTIONS, PERCENTAGE FEMALE, AND
ALL OLDER ADULT HOSPITAL DISCHARGES (1996-98)
(TABLE 4)**

- Women accounted for 53.3 percent of all older adult discharges.
- Overall, about two of five older adult discharges were either 65-74 (60,455) or 75-84 (57,698) while about one in six were 85 and over (24,266). The number age 65-74 was two and one-half times the number 85 and over.
- Among older adult men the number 65-74 was 3.6 times the number 85 and over compared to 1.9 times among older adult women.
- The older the age group the greater was the female concentration. Slightly less than one-half of discharges age 65-74 were female compared to nearly two-thirds of discharges age 85 and over.
- Males were more likely to be 65-74 (47.0 vs. 38.5 percent) whereas females were more likely to be 85 and over (20.6 vs. 13.0 percent).
- Utah hospital discharge rates, as with the nation as a whole (Popovic and Kozak, 2000: Table 2), increase with age. Utah's hospital discharge rates among those 85 and over were more than double those for age 65-74, overall and for both women and men.
- The hospital discharge rate for older adult Utahns between 1996 and 1998 was below that of the nation observed in the 1998 National Hospital Discharge Survey in each of the three age groups (Popovic and Kozak, 2000: Table 6).
- Overall and across the three age groups, hospital discharge rates were somewhat higher for men than women. Nationally, the discharge rate for older adult men in 1998 was only minimally above that of their female counterparts and the difference increased slightly the older the age group (Popovic and Kozak, 2000: Table 2).

Table 4. Number of Discharges, Percentage Distribution, and Hospital Discharge Rates (Per

**10,000 Population) by Age and Gender and Percentage of Discharges Female Overall and by
Age: All Hospital Discharges for Adults Age 65 and Older : 1996-1998**

Age Group	Total	Female	Male	% Female
Number of Discharges (1996-98)				% Female
Total (65 and over)	142,388	75,839	66,569	53.3 %
65-74	60,455	29,188	31,265	48.3 %
75-84	57,698	31,023	26,668	53.8 %
85 and over	24,266	15,628	8,636	64.4 %
Ratio: 65-74/85+	2.49	1.87	3.62	
Percentage Distribution of Discharges (1996-98)				
Total (65 and over)	100.0	100.0	100.0	
65-74	42.5	38.5	47.0	
75-84	40.5	40.9	40.1	
85 and over	17.0	20.6	13.0	
Hospital Discharge Rates (1996-98)				Ratio: Male/Female
Total (65 and over)	2653.7	2498.7	2856.5	1.14
65-74	2030.2	1837.4	2250.4	1.22
75-84	3121.1	2884.9	3448.7	1.20
85 and over	4501.2	4209.7	5144.8	1.22
Ratio: 85+/65-74	2.22	2.29	2.29	

Note: Not all percentages round to 100.0 due to rounding errors.

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

GENDER-AGE DIFFERENCES - MEAN LENGTH OF STAY (IN DAYS) AND MEAN CHARGES: ALL OLDER ADULT (65 AND OVER) HOSPITAL DISCHARGES (1996-98)
(TABLE 5)

Mean Length of Stay (In Days)

- The average length of stay was slightly higher among those in the two oldest age groups than in the younger age group. Overall and in each age group, the average length of stay for older adult Utahns between 1996 and 1998 was below that of the nation evident in the 1998 National Hospital Discharge Survey (Popovic and Kozak, 2000: Table 6).
- Overall, and in each age group, the mean length of stay for men was slightly higher than for women. Nationally, in 1998, there was virtually no difference in average length of stay between women and men (6.2 vs. 6.1 days); however, the difference was greater among those 65-74 with women staying 0.3 of a day longer (6.1 vs. 5.8 days) (Popovic and Kozak, 2000: Table 2).
- There was no consistent increase or decrease in mean length of stay in each succeeding age group for both women and men.
- The mean length of stay for women age 85 and over was 0.3 of a day longer than for women aged 65-74 whereas among men the length of stay was roughly equal.

Mean Hospital Charges

- Overall, mean hospital charges for men were \$1,700 or 16 percent higher than for women.
- Mean hospital charges for men were also higher than among women in each age group, although the difference narrowed across the age groups.
- For both women and men, mean charges declined across age groups with the major drop occurring in the oldest age group. Among those 85 and over, mean charges for women were 76 percent and among men 72 percent of those for the 65-74 age group, although length of stay was roughly similar.

Table 5. Mean Length of Stay (In Days) and Mean Hospital Charges by Gender and Age for Older Adults Aged 65 and Over: All Hospital Discharges (1996-1998)

	Total	65-74	75-84	85 and Over	Ratio: 85+/65-74
Length of Stay (In Days)					
Total	5.2	5.0	5.3	5.2	1.04
Female	5.1	4.9	5.2	5.2	1.06
Male	5.3	5.2	5.5	5.3	1.02
Ratio: M/F	1.04	1.06	1.06	1.02	
Mean Charges					
Total	\$11,206	\$12,192	\$11,196	\$8,897	0.73
Female	\$10,454	\$11,356	\$10,538	\$8,599	0.76
Male	\$12,154	\$13,075	\$12,039	\$9,451	0.72
Ratio: M/F	1.16	1.15	1.14	1.10	
SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.					

OVERALL AND GENDER-AGE DIFFERENCES IN DISCHARGE STATUS (1996-98)
(TABLE 6)

Overall Differences

- About three of five older adult inpatients were discharged to home self care, one in four to institutional care, and about one in 13 to organized home service.
- One in 25 inpatients died in the hospital. According to 1998 National Hospital Discharge Survey data, one in twenty died in the hospital nationally (Popovic and Kozak, 2000: Table 4)

Gender-Age Differences

- Men were more likely to go to home self-care whereas women were more likely to be discharged to institutional care overall and in each age group.
- The older the age group the lower the likelihood of being discharged to home self care and the greater the likelihood of being discharged to institutional care overall and among both women and men.
- The older the age group the greater was the likelihood of in-hospital mortality, overall and for women and men. Those 85 and over were more than twice as likely as those 65-74 to die in the hospital (6.7 vs. 3.1). An increase in the likelihood of an in-hospital death the older the age agroup, overall and among men and women, was also apparent nationally in 1998 and the rate of in-hospital mortality among those 85 and over was also more than twice that among those 65-74 (7.5 vs. 3.6 percent) (Popovic and Kozak, 2000: Table 4).
- The rate of in-hospital mortality among older adult Utahns in each of the three age groups between 1996 and 1998 was slightly below that observed in the 1998 National Hospital Discharge Survey (Popovic and Kozak, 2000: Table 4).
- Men were minimally more likely to die in the hospital than women overall and in each age group. The role of slightly higher age-specific in-hospital mortality among men than women on overall mortality differences was offset to some extent by the relatively higher concentration of women in the oldest ages, as pointed out earlier. According to 1998 National Hospital Discharge Survey data, men were also more likely to die in the hospital than women overall and in each age group nationally, with the difference increasing the older the age group (Popovic and Kozak, 2000: Table 6).

Table 6. Discharge Status Percentage Distribution by Gender and Age for Older Adult Utahns Age 65 and Over: 1996-98

Gender and Age	Discharge Status						Total
	Home Self Care	Organized Home Service	Institutional Care	Another Hospital	Expired	Other/Missing	
Total	61.9	8.1	22.9	2.4	4.4	0.4	100.0
65-74	72.6	6.8	14.4	2.7	3.1	0.4	100.0
75-84	59.2	8.9	24.5	2.4	4.7	0.4	100.0
85 and over	41.8	9.5	40.1	1.5	6.7	0.4	100.0
Female	56.5	9.2	27.8	2.1	4.0	0.4	100.0
65-74	68.1	8.1	18.3	2.4	2.8	0.4	100.0
75-84	54.3	10.0	29.0	2.2	4.1	0.4	100.0
85 and over	39.1	9.9	43.3	1.4	6.0	0.3	100.0
Male	68.1	6.8	17.2	2.7	4.8	0.4	100.0
65-74	76.8	5.5	10.9	3.0	3.4	0.4	100.0
75-84	64.8	7.5	19.2	2.7	5.4	0.4	100.0
85 and over	46.9	8.9	34.2	1.8	7.9	0.4	100.0

Note: Percentages do not always round to 100.0 due to rounding errors.

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER DIFFERENCES IN SELECTED HOSPITALIZATION INDICATORS
THREE MOST FREQUENT PRIMARY DIAGNOSES (1996-98)
(TABLE 7)**

Hospital Discharge Rates

- Osteoarthritis had the highest hospital discharge rate among women (142.4 per 10,000 population) while coronary atherosclerosis and other heart disease was highest for men (236.4 per 10,000 population).
- Pneumonia ranked second among both women (139.7) and men (189.6).
- Congestive heart failure ranked third (116.5) among women whereas acute myocardial infarction ranked third among males (128.5).

Mean Length of Stay (In Days)

- For both females and males rehabilitation care/fitting of prostheses had the longest stay among the most frequent primary diagnoses (11.5 and 12.8 days, respectively).
- Hip fracture and acute cerebrovascular disease, the primary diagnoses with the next longest stays among women, had average stays of just under six days.
- Among men, acute cerebrovascular disease had the second longest length of stay (6.1 days), followed by pneumonia (5.6 days).
- The average length of stay for acute cerebrovascular disease was .3 of a day longer for men than women (6.1 vs. 5.8 days).

Mean Hospital Charges

- The primary diagnoses with the highest mean hospital charges among both women and men were acute myocardial infarction and coronary atherosclerosis and other heart disease in that order.
- The mean hospital charge for acute myocardial infarction was nearly \$1,800 more for men than women (\$19,877 vs. \$18,101). The mean hospital charge for coronary atherosclerosis and other heart disease was over \$1,300 more for men than women (\$19,844 vs. \$17,509).
- Osteoarthritis ranked third among women (\$15,048) while device, implant, or graft complication ranked third among men (\$16,526).

Table 7. Selected Primary Diagnoses with Highest Hospital Discharge Rates (Per 10,000 Population) and Numbers, Longest Mean Length of Stay (In Days), and Highest Mean Hospital Charges Among Ten Most Frequent Primary Diagnoses for Female and Male Older Adults Age 65 and Over: 1996-1998

Gender and Diagnosis	Indicators
Hospital Discharge Rates (Per 10,000 Population) and Numbers	
Female	
Osteoarthritis	142.4 (4,323)
Pneumonia	139.7 (4,239)
Congestive heart failure	116.5 (3,535)
Male	
Coronary atherosclerosis and other heart disease	236.4 (5,511)
Pneumonia	189.6 (4,418)
Acute myocardial infarction	128.5 (2,996)
Mean Length of Stay (In Days)	
Female	
Rehabilitation care/fitting of prostheses	11.5
Hip fracture	5.9
Acute cerebrovascular disease	5.8
Male	
Rehabilitation care/fitting of prostheses	12.8
Acute cerebrovascular disease	6.1
Pneumonia	5.6
Mean Hospital Charges	
Female	
Acute myocardial infarction	\$18,101
Coronary atherosclerosis and other heart disease	\$17,509
Osteoarthritis	\$15,048
Male	
Acute myocardial infarction	\$19,877
Coronary atherosclerosis and other heart disease	\$19,844
Device, implant, graft complication	\$16,526

() = Number of discharges

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER DIFFERENCES IN IN-HOSPITAL MORTALITY
SELECTED PRIMARY DIAGNOSES (1996-1998)
(TABLE 8)**

- The four primary diagnoses with the highest percentage of in-hospital deaths were similar for both women and men, albeit differing slightly in ordering.
- About one in nine women diagnosed with acute myocardial infarction or acute cerebrovascular disease and about one in 17 diagnosed with pneumonia died in the hospital.
- One in nine men diagnosed with acute cerebrovascular disease, one in 12 diagnosed with acute myocardial infarction, and one in 14 with pneumonia died in the hospital.
- Hospital discharges with fracture of neck of femur (hip) ranked fifth among women whereas gastrointestinal hemorrhage ranked fifth among men in in-hospital mortality rate.
- The rate of in-hospital mortality for acute myocardial infarction is somewhat higher for women than men (11.1 vs. 8.5 percent), while the rate for pneumonia is slightly higher for men (7.7 vs. 6.0 percent).

Table 8. Selected Primary Diagnoses with Highest Percentage Who Died in the Hospital Among Ten Most Frequent Primary Diagnoses for Female and Male Older Adults Age 65 and Over: 1996-98

Gender and Diagnosis	Percentage Who Died in the Hospital
-----------------------------	--

Female

Acute myocardial infarction	11.1 %
Acute cerebrovascular disease	10.7 %
Pneumonia	6.0 %
Congestive heart failure	5.3 %
Fracture neck of femur (hip)	5.3 %

Male

Acute cerebrovascular disease	11.1 %
Acute myocardial infarction	8.5 %
Pneumonia	7.7 %
Congestive heart failure	5.6 %
Gastrointestinal hemorrhage	4.7 %

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health

**GENDER DIFFERENCES IN SELECTED HOSPITALIZATION INDICATORS
THREE MOST FREQUENT PRIMARY PROCEDURES (1996-98)
(TABLE 9)**

Hospital Discharge Rates

- For women, the procedures with the highest hospital discharge rate were hip replacement (90.4 per 10,000 population), arthroplasty of knee (88.6) and hip/femur fracture or dislocation (66.1). Around 2,700 each of the former two procedures and around 2,000 of the latter procedures were conducted.
- For men, the procedures with the highest hospital discharge rate were PTCA (109.8), diagnostic cardiac catheterization (106.2), and CABG (85.6). Around 2,500 each of the former two procedures and nearly 2,000 of the latter procedure were conducted.

Mean Length of Stay (In Days)

- For females, hip/femur fracture or dislocation treatment had the longest mean length of stay (4.8 days) whereas CABG was topmost among men (8.8 days).
- Among both women and men, cholecystectomy/common duct exploration (4.7 and 5.4 days, respectively) and total or partial hip replacement (5.4 and 5.1 days, respectively) ranked next.
- The average lengths of stay for cholecystectomy/common duct exploration and total or partial hip replacement were somewhat longer among men than women.

Mean Hospital Charges

- Among females, PTCA had the highest mean hospital charge (\$ 20,019) while CABG had the highest mean hospital charge for men (\$36,866).
- Total or partial hip replacement ranked second among women (\$17,469) and arthroplasty of the knee ranked third (\$16,919).
- Cardiac pacemaker insertion, revision, replacement, and removal ranked second among men (\$ 22,912) and PTCA ranked third (\$19,209).
- The mean hospital charge for PTCA was about \$ 800 more for women than for men.

Table 9. Selected Primary Procedures with Highest Hospital Discharge Rates (Per 10,000 Population) and Numbers , Longest Mean Length of Stay (In Days), and Highest Mean Hospital Charges Among Ten Most Frequent Primary Procedures for Female and Male Older Adults Age 65 and Over: 1996-1998

Gender and Procedures	Indicators
Hospital Discharge Rates (Per 10,000 Population) and Numbers	
Female	
Total and partial hip replacement	90.4 (2,745)
Arthroplasty of knee	88.6 (2,688)
Hip/femur fracture or dislocation treatment	66.1 (2,006)
Male	
PTCA	109.8 (2,559)
Diagnostic cardiac catheterization	106.2 (2,477)
CABG	85.6 (1,994)
Mean Length of Stay (In Days)	
Female	
Hip/femur fracture or dislocation treatment	4.8
Cholecystectomy and common duct exploration	4.7
Total and partial hip replacement	4.7
Male	
CABG	8.8
Cholecystectomy and common duct exploration	5.4
Total and partial hip replacement	5.1
Mean Hospital Charges	
Female	
PTCA	\$20,019
Total and partial hip replacement	\$17,469
Arthroplasty of knee	\$16,919
Male	
CABG	\$36,866
Cardiac pacemaker insertion, revision, replacement, removal	\$22,912
PTCA	\$19,209
() = Number of discharges	
SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.	

**GENDER DIFFERENCES IN IN-HOSPITAL MORTALITY
SELECTED PRIMARY PROCEDURES (1996-1998)
(TABLE 10)**

- Among women, PTCA was the primary procedure with the highest percentage who died in the hospital (2.3 percent) whereas CABG surgery was highest among men (3.8 percent)
- Hip/femur fracture treatment ranked second among women in in-hospital mortality while hip replacement ranked second among men (about 2.0 percent each).
- Cholecystectomy ranked third among women while cholecystectomy and diagnostic cardiac catheterization were tied for third among men.

Table 10. Selected Primary Procedures with Highest Percentage Who Died in the Hospital Among Ten Most Frequent Primary Procedures for Female and Male Older Adults Age 65 and Over: 1996-1998

Gender and Procedure	Percentage Who Died in the Hospital
Female	
Percutaneous transluminal coronary angioplasty (PTCA)	2.3 %
Treatment, fracture or dislocation of hip and femur	2.0 %
Cholecystectomy and common duct exploration	1.8 %
Diagnostic cardiac catheterization, arteriograph	1.6 %
Hip replacement	1.3 %
Male	
Coronary artery bypass graft (CABG)	3.8 %
Hip replacement	2.1 %
Diagnostic cardiac catheterization, arteriograph	1.9 %
Cholecystectomy and common duct exploration	1.9 %
Cardiac Pacemaker (Insertion, Revision, Replacement, Removal)	1.4 %

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**AGE DIFFERENCES IN SELECTED HOSPITALIZATION INDICATORS
THREE MOST FREQUENT PRIMARY DIAGNOSES (1996-98)
(TABLE 11)**

Hospital Discharge Rates

- Pneumonia ranked third among those 65-74, but topmost among those 75-84 and 85 and over. The discharge rate for pneumonia among those 85 and over was nearly five times that for those 65-74 (427.9 vs. 86.4) and more than double that for those 75-84 (427.9 vs. 204.4).
- Coronary atherosclerosis and other heart disease ranked topmost in the youngest age group and second in the middle group (156.6 and 184.8).
- Congestive heart failure ranked third in the middle and oldest age groups. The discharge rate for congestive heart failure among those age 85 and over was more than double that among those 75-84 (319.1 vs. 156.1).
- Hip fracture was within the top three only in the oldest age group, ranking second (356.5).

Mean Length of Stay (In Days)

- Acute cerebrovascular disease ranked first among those 65-74 and third among those 75-84 and 85 and over. The average stay for acute cerebrovascular disease in the youngest and middle groups was six-tenths of a day longer than in the oldest group (6.1 vs. 5.5 days).
- Rehabilitation care/fitting of prostheses, hip fracture, and acute cerebrovascular disease occupied the top three ranks, in that order, in both the middle and oldest age groups.
- The average stay for rehabilitation care/fitting of prostheses was nearly 12 days in the middle and oldest age groups. The average hip fracture stay was a half day longer among those 75-84 than among those 85 and over (6.4 vs. 5.9 days).
- Pneumonia and acute myocardial infarction were among the top three in only the youngest age group, ranking second and third, respectively.

Mean Hospital Charges

- Acute myocardial infarction had the highest mean hospital charge for those 65-74, ranked second among those 75-84, and third among those 85 and over.
- The average charge for acute myocardial infarction for those 65-74 (\$21,703) and those 75-84 (\$19,050) was considerably above that for those 85 and over (\$11,843).
- Coronary atherosclerosis and other heart disease ranked first among those 75-84 (\$19,266) while rehabilitation care/prostheses fitting ranked first among those 85 and over (\$12,533).

Table 11. Selected Primary Diagnoses with Highest Hospital Discharge Rates (Per 10,000 Population) and Numbers, Longest Mean Length of Stay (In Days), and Highest Mean Hospital Charges Among Ten Most Frequent Diagnoses for Older Adults Age 65-74, 75-84 and 85 and Over: 1996-98

Age and Primary Diagnosis	Indicators
Hospital Discharge Rates (Per 10,000 Population) and Numbers	
65-74	
Coronary atherosclerosis and other heart disease	156.6 (4,664)
Osteoarthritis	129.0 (3,840)
Pneumonia	86.4 (2,572)
75-84	
Pneumonia	204.4 (3,779)
Coronary atherosclerosis and other heart disease	184.8 (3,418)
Congestive heart failure	156.1 (2,885)
85 and over	
Pneumonia	427.9 (2,307)
Hip fracture	356.5 (1,924)
Congestive heart failure	319.1 (1,720)
Mean Length of Stay (In Days)	
65-74	
Acute cerebrovascular disease	6.1
Pneumonia	5.5
Acute myocardial infarction	5.8
75-84	
Rehabilitation care/fitting of prostheses	11.9
Hip fracture	6.4
Acute cerebrovascular disease	6.1
85 and over	
Rehabilitation care/fitting of prostheses	11.7
Hip fracture	5.9
Acute cerebrovascular disease	5.5
Mean Hospital Charges	
65-74	
Acute myocardial infarction	\$21,703
Coronary atherosclerosis and other heart disease	\$19,727
Device, implant, graft complication	\$16,271
75-84	
Coronary atherosclerosis and other heart disease	\$19,266
Acute myocardial infarction	\$19,050
Osteoarthritis	\$15,384
85 and over	
Rehabilitation care/fitting of prostheses	\$12,533
Hip Fracture	\$12,237
Acute myocardial infarction	\$11,843

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

AGE DIFFERENCES IN IN-HOSPITAL MORTALITY
SELECTED PRIMARY DIAGNOSES (1996-98)
(Table 12)

- Acute cerebrovascular disease ranked first and acute myocardial infarction second among those 65-74 and 75-84 years of age in rate of in-hospital mortality. The order was reversed among those 85 and over.
- Pneumonia ranked third in each of the three age groups.
- For acute cerebrovascular disease, acute myocardial infarction, and pneumonia, the percentage of discharges involving an in-hospital death increased with age.
- Where acute myocardial infarction was listed as the primary diagnosis, the percentage of inpatients age 85 and over who died in the hospital was more than double that among those 65-74.

Table 12. Selected Primary Diagnoses with Highest Percentage Who Died in the Hospital Among Ten Most Frequent Primary Diagnoses for Older Adults Age 65-74, 75-84, 85 and Over: 1996-1998.

Age and Primary Diagnosis	Percentage Who Died in the Hospital
65-74	
Acute cerebrovascular disease	8.8 %
Acute myocardial infarction	6.3 %
Pneumonia	4.8 %
Congestive heart failure	4.2 %
75-84	
Acute cerebrovascular disease	11.4 %
Acute myocardial infarction	10.7 %
Pneumonia	7.2 %
Gastrointestinal hemorrhage	4.2 %
85 and Over	
Acute myocardial infarction	16.4 %
Acute cerebrovascular disease	12.5 %
Pneumonia	8.7 %
Congestive heart failure	7.4 %

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**AGE DIFFERENCES IN SELECTED HOSPITALIZATION INDICATORS
THREE MOST FREQUENT PRIMARY PROCEDURES (1996-1998)
IN EACH AGE GROUP
(TABLE 13)**

Hospital Discharge Rates

- Knee arthroplasty ranked first among those age 65-74 (82.7) and third among those 75-84 (90.4).
- Diagnostic cardiac catheterization ranked second among those 65-74 and 75-84 (79.4 and 92.8).
- Total or partial hip replacement ranked first among those 75-84 (94.9). Although ranking second among those 85 and over, it's rate was more than one and one-half times greater than among those 75-84 (154.8 vs. 94.9).

Mean Length of Stay (In Days)

- Colorectal resection had the longest mean length of stay in the youngest and oldest age groups (9.4 and 9.6 days) while CABG ranked first in the middle group (9.9 days).
- The average length of stay for CABG surgery in the middle age group was 1.6 days longer than in the youngest age group (9.9 vs. 8.3 days).

Mean Hospital Charges

- CABG had the highest mean hospital charge for those age 65-74 and 75-84 (\$36,588 and \$39,956) while colorectal resection ranked first among those 85 and over (\$21,994).
- Colorectal resection ranked second among those 65-74 (\$20,131) while PTCA ranked second among those 75-84 (\$19,864) and cardiac pacemaker insertion, revision, replacement or removal occupied second position among those 85 and over (\$18,401).
- PTCA ranked third among those 65-74 (\$19,255) while knee arthroplasty ranked third among those 75-84 (\$17,264), and total/partial hip replacement third in the older group (\$16,411).

Table 13. Selected Primary Procedures with Highest Hospital Discharge Rates (Per 10,000 Population) and Numbers, Longest Mean Length of Stay (In Days), and Highest Mean Hospital Charges Among Most Frequent Primary Procedures for Older Adults Age 65-74,75-84 and 85 and Over: 1996-98

Age and Primary Procedure	Indicators
---------------------------	------------

Hospital Discharge Rates (Per 10,000 Population) and Numbers

65-74

Arthroplasty of knee	82.7 (2,464)
Diagnostic cardiac catheterization	79.4 (2,363)
PTCA	77.4 (2,307)

75-84

Total/partial hip replacement	94.9 (1,755)
Diagnostic cardiac catheterization	92.8 (1,716)
Arthroplasty of the knee	90.4 (1,671)

85 and over

Hip/Femur fracture or dislocation treatment	214.2 (1,156)
Total/partial hip replacement	154.0 (830)
Upper gastrointestinal endoscopy/biopsy	115.7 (624)

Mean Length of Stay (In Days)

65-74

Colorectal resection	9.4
CABG	8.3
Total/partial hip replacement	4.6

75-84

CABG	9.9
Hip/femur fracture or dislocation treatment	5.0
Blood transfusion	4.9

85 and over

Colorectal resection	9.6
Cholecystectomy/common duct exploration	5.7
Total/partial hip replacement	5.3

Mean Hospital Charges

65-74

CABG	\$36,588
Colorectal resection	\$20,131
PTCA	\$19,255

75-84

CABG	\$39,956
PTCA	\$19,864
Arthroplasty of knee	\$17,264

85 and over

Colorectal resection	\$21,994
Cardiac pacemaker insertion, revision, replacement, removal	\$18,401
Total/partial hip replacement	\$16,411

**AGE DIFFERENCES IN IN-HOSPITAL MORTALITY
SELECTED PRIMARY PROCEDURES (1996-98)
(TABLE 14)**

- Colorectal resection ranked first among those 65-74 and 85 and over while CABG was topmost among those 75-84. Among those 85 and over, one out of eight discharges with colorectal resection as the primary procedure had an in-hospital death.
- CABG ranked second among those 65-74 in the percentage of discharges who had died in the hospital, diagnostic cardiac catheterization among those 75-84, and hip replacement among those 85 and over.
- The in-hospital mortality rate among those discharges 85 and over with colorectal resection as the primary procedure was nearly four times that among discharges 65-74 (13.1 vs. 3.7 percent).

Table 14. Selected Primary Procedures with Highest Percentage Who Died in the Hospital Among Ten Most Frequent Primary Diagnoses for Older Adults Age 65-74, 75-84, and 85 and Over: 1996-1998

Age and Primary Procedure	Percentage Who Died in the Hospital
65-74	
Colorectal resection	3.7 %
Coronary artery bypass graft (CABG)	3.0 %
Cholecystectomy, common duct exploration	3.0 %
75-84	
Coronary artery bypass graft (CABG)	5.0 %
Diagnostic cardiac catheterization, arteriograph	2.5 %
Percutaneous transluminal coronary angioplasty (PTCA)	2.2 %
85 and Over	
Colorectal resection	13.1 %
Total/partial hip replacement	5.1 %
Treatment of fracture/dislocation of hip and femur	3.3 %

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER-AGE SUBGROUP HOSPITAL DISCHARGE RATE DIFFERENCES
SELECTED MOST FREQUENT DIAGNOSES (1996-1998)
(TABLE 15)**

- Overall, men's discharge rate for coronary atherosclerosis and other related heart diseases was more than double that for women (Ratio M/F = 2.22). The difference declined with age; however, in the oldest age group the rate for men was still 1.6 times that for women
- On the other hand, the male osteoarthritis discharge rate was only 79 percent that of women (Ratio M/F = 0.79). The difference, however, narrowed with age with virtually no difference between women and men in the oldest age group.
- Discharge rates for pneumonia, acute myocardial infarction, congestive heart failure, acute cerebrovascular disease, rehabilitation care/prostheses fitting, and cardiac dysrhythmias increased with age for both women and men.
- On the other hand, for both men and women, the osteoarthritis discharge rate increased among those 75-84, but then, in the oldest group, dipped below the 65-74 rate.
- The discharge rate for pneumonia among men age 85 and over was 6 times and for women 4.7 times that of their counterparts age 65-74 (Ratio 85+/65-74 = 6.02 and 4.70).
- The discharge rate for congestive heart failure among both women and men age 85 and over was more than five times (Ratio 85+/65-74 = 5.45 and 5.11) and for acute cerebrovascular disease more than four times that of their counterparts age 65-74 (Ratio 85+/65-74 = 4.23 and 4.27) .
- In contrast, the osteoarthritis rate among the oldest women was one-half and among the oldest men two-thirds that of the youngest women and men (Ratio 85+/65-74 = 0.49 and 0.66)

Table 15. Gender-Age Subgroup Differences in Hospital Discharge Rates for Selected Most Frequent Primary Diagnoses for Older Adults Age 65 and Over: 1996-98

Diagnoses and Gender	Total	65-74	75-84	85 +	Ratio: 85+/65-74
Coronary Atherosclerosis					
Female	106.3	94.7	124.9	101.6	1.07
Male	236.4	227.4	268.1	165.0	0.73
Ratio (M/F)	2.22	2.40	2.15	1.62	
Pneumonia					
Female	139.7	74.0	164.7	348.0	4.70
Male	189.6	100.5	259.5	604.7	6.02
Ratio (M/F)	1.36	1.36	1.58	1.74	
Acute Myocardial Infarction					
Female	70.2	48.9	86.0	115.8	2.37
Male	128.5	109.6	144.2	212.1	1.94
Ratio (M/F)	1.83	2.24	1.68	1.83	
Congestive Heart Failure					
Female	116.5	54.6	145.3	297.4	5.45
Male	125.9	71.8	170.8	367.0	5.11
Ratio (M/F)	1.08	1.32	1.18	1.23	
Osteoarthritis					
Female	142.4	146.5	161.1	71.1	0.49
Male	112.6	108.9	128.0	71.5	0.66
Ratio(M/F)	0.79	0.74	0.79	1.01	
Acute Cerebrovascular Disease					
Female	106.2	56.9	132.6	240.5	4.23
Male	105.5	66.4	137.2	283.6	4.27
Ratio(M/F)	0.99	1.17	1.04	1.18	
Rehabilitation Care/Prostheses					
Female	71.5	44.9	93.2	122.3	2.72
Male	62.2	40.7	83.3	143.0	3.51
Ratio(M/F)	0.87	0.91	0.89	1.17	
Cardiac Dysrhythmias					
Female	69.9	47.0	87.3	117.7	2.50
Male	87.3	70.2	109.0	128.7	1.83
Ratio(M/F)	1.25	1.49	1.25	1.09	

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER-AGE SUBGROUP MEAN LENGTH OF STAY (IN DAYS) DIFFERENCES
SELECTED MOST FREQUENT PRIMARY DIAGNOSES (1996-1998)
(TABLE 16)**

- Across diagnoses, the mean length of stay was greater for men than women; however, the differences were slight, excepting rehabilitation care/ prostheses fitting where the difference was 1.3 days (12.8 vs. 11.5 days).
- The older the age group the less the gap between men and women in average length of stay for rehabilitation care/ prostheses fitting.
- For both women and men, mean length of stay for pneumonia and congestive heart failure decreased slightly with age, but increased slightly for osteoarthritis.
- However, among women only, mean length of stay decreased with age for acute myocardial infarction while increasing for cardiac dysrhythmias. For acute cerebrovascular disease and rehabilitation care/fitting of prostheses, mean length of stay decreased steadily only for men.
- The mean length of stay for osteoarthritis among women age 85 and over was 1.2 days **longer** than for women age 65-74 while the mean length of stay for rehabilitation care/prostheses fitting among men aged 85 and over was 1.6 days **shorter** than for men age 65-74.

Table 16. Gender-Age Subgroup Differences in Mean Length of Stay (In Days) for Selected Most Frequent Primary Diagnoses: Older Adults Age 65 and Over: 1996-98

Diagnoses and Gender	Total	65-74	75-84	85 +	Ratio: 85+/65-74
Coronary Atherosclerosis					
Female	4.1	4.0	4.3	3.5	0.87
Male	4.4	4.2	4.8	3.7	0.88
Ratio (M/F)	1.07	1.05	1.12	1.06	
Pneumonia					
Female	5.2	5.4	5.3	5.1	0.94
Male	5.6	5.7	5.6	5.3	0.93
Ratio (M/F)	1.08	1.06	1.06	1.04	
Acute Myocardial Infarction					
Female	5.3	5.5	5.4	4.8	0.87
Male	5.4	5.3	5.6	5.0	0.94
Ratio (M/F)	1.02	0.96	1.04	1.04	
Congestive Heart Failure					
Female	4.6	4.8	4.7	4.5	0.94
Male	4.9	5.3	4.9	4.4	0.83
Ratio (M/F)	1.07	1.10	1.04	0.98	
Osteoarthritis					
Female	4.4	4.2	4.5	5.4	1.29
Male	4.4	4.3	4.4	5.0	1.16
Ratio(M/F)	1.00	1.02	0.98	0.93	
Acute Cerebrovascular Disease					
Female	5.8	6.0	6.1	5.2	0.87
Male	6.1	6.3	6.0	5.9	0.94
Ratio(M/F)	1.05	1.05	0.98	1.13	
Rehabilitation Care/Prostheses					
Female	11.5	11.5	11.5	11.6	1.01
Male	12.8	13.3	12.7	11.7	0.88
Ratio(M/F)	1.11	1.16	1.10	1.01	
Cardiac Dysrhythmias					
Female	2.9	2.6	2.8	3.4	1.31
Male	3.1	3.1	3.1	3.1	1.00
Ratio(M/F)	1.07	1.19	1.11	0.91	

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER-AGE SUBGROUP MEAN HOSPITAL CHARGES DIFFERENCES
SELECTED MOST FREQUENT PRIMARY DIAGNOSES (1996-98)
(TABLE 17)**

- Across age groups, mean hospital charges were generally greater for men than women.
- Mean charge for rehabilitation care/prostheses fitting among men was over \$3,300 greater than for women (Ratio M/F = 1.28). The difference for coronary atherosclerosis and other heart disease was over \$2,300 (Ratio M/F = 1.13) and cardiac dysrhythmias nearly \$2,000 (Ratio M/F = 1.26).
- The relatively higher charges for coronary atherosclerosis and other heart disease for men more than doubled from around \$1,800 among those 65-74 to nearly \$4,000 among those 85 and over.
- On the other hand, for rehabilitation care/prostheses fitting, the difference declined by about one-half from more than \$4,000 in the youngest age group to about \$2,100 in the oldest age group.
- Among both women and men, mean hospital charges declined steadily with age for pneumonia, acute myocardial infarction, congestive heart failure, acute cerebrovascular disease and rehabilitation care/prostheses fitting.
- For both women and men age 85 and over, mean charges for coronary atherosclerosis, pneumonia, acute myocardial infarction, congestive heart failure and acute cerebrovascular disease ranged from one half to around three quarters those of their counterparts age 65-74.

Table 17. Gender-Age Subgroup Differences in Mean Hospital Charges for Selected Most Frequent Primary Diagnoses: Older Adults Age 65 and Over: 1996-1998

Diagnoses and Gender	Total	65-74	75-84	85 and Over	Ratio: 85+/65-74
Coronary Atherosclerosis					
Female	\$17,509	\$19,199	\$17,678	\$10,214	0.53
Male	19,844	20,001	20,379	14,165	0.71
Ratio (M/F)	1.13	1.04	1.15	1.39	
Pneumonia					
Female	8,475	9,637	8,504	7,382	0.77
Male	9,575	10,877	9,468	8,145	0.75
Ratio (M/F)	1.13	1.13	1.11	1.10	
Acute Myocardial Infarction					
Female	18,101	21,784	18,110	11,408	0.52
Male	19,877	21,660	19,870	12,385	0.57
Ratio (M/F)	1.10	0.99	1.10	1.09	
Congestive Heart Failure					
Female	7,735	9,156	7,987	6,260	0.68
Male	8,516	9,995	8,192	6,913	0.69
Ratio (M/F)	1.10	1.09	1.03	1.10	
Osteoarthritis					
Female	15,048	15,094	15,061	14,549	0.96
Male	15,936	15,901	15,968	16,108	1.01
Ratio(M/F)	1.06	1.05	1.06	1.11	
Acute Cerebrovascular Disease					
Female	9,299	10,913	9,371	7,550	0.69
Male	9,737	10,705	9,572	8,296	0.77
Ratio (M/F)	1.05	0.98	1.02	1.10	
Rehabilitation Care/Prostheses					
Female	12,225	12,332	12,304	11,882	0.96
Male	15,599	16,953	15,097	13,783	0.81
Ratio (M/F)	1.28	1.37	1.23	1.16	
Cardiac Dysrhythmias					
Female	7,710	7,464	7,834	7,863	1.05
Male	9,691	9,994	9,512	9,104	0.91
Ratio (M/F)	1.26	1.34	1.21	1.16	

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER-AGE DIFFERENCES IN IN-HOSPITAL MORTALITY
SELECTED PRIMARY DIAGNOSES (1996-98)
(TABLE 18)**

- The percentage of male discharges age 65-74 diagnosed with coronary atherosclerosis who died in the hospital was only about 56 percent that of their female counterparts. However, among those 85 and over, the percentage of men diagnosed with coronary atherosclerosis or osteoarthritis who died was more than triple that of their female counterparts
- In-hospital mortality rates increased steadily across age groups for both women and men in the case of pneumonia and acute myocardial infarction. They increased steadily for men only in the case of coronary atherosclerosis and congestive heart failure and for women only in the case of acute cerebrovascular disease and cardiac dysrhythmias.
- In the case of pneumonia, the positive relationship between age and in-hospital mortality was somewhat stronger for women than men whereas the opposite was the case for acute myocardial infarction.
- Among women age 85 and over diagnosed with coronary atherosclerosis and other heart disease, the percentage who died in the hospital was about two-thirds of women aged 65-74. In contrast, the percentage of men in the oldest age group who died in the hospital was more than four times that among the youngest men.

Table 18. Gender-Age Subgroup Differences in Percentage Who Died in the Hospital, for Selected Most Frequent Primary Diagnoses, Older Adults Age 65 and Over: 1996-1998

Diagnoses and Gender	Total	65-74	75-84	85 +	Ratio: 85+/65-74
Coronary Atherosclerosis					
Female	1.3%	1.6%	1.0%	1.1%	0.69
Male	1.4%	0.9%	1.8%	4.0%	4.44
Ratio (M/F)	1.08	0.56	1.80	3.64	
Pneumonia					
Female	6.0%	3.5%	6.0%	8.3%	2.37
Male	7.7%	5.9%	8.2%	9.2%	1.56
Ratio (M/F)	1.28	1.69	1.37	1.11	
Acute Myocardial Infarction					
Female	11.1%	7.9%	11.7%	15.8%	2.00
Male	8.5%	5.4%	9.9%	17.1%	3.17
Ratio (M/F)	0.77	0.68	0.85	1.08	
Congestive Heart Failure					
Female	5.3%	4.8%	4.0%	7.5%	1.56
Male	5.6%	3.6%	6.4%	7.1%	1.97
Ratio (M/F)	1.06	0.75	1.60	0.95	
Osteoarthritis					
Female	0.1%	0.1%	0.1%	0.8%	8.00
Male	0.2%	0.1%	0.1%	2.5%	25.00
Ratio (M/F)	2.00	1.00	1.00	3.13	
Acute Cerebrovascular Disease					
Female	10.7%	8.5%	10.4%	13.2%	1.55
Male	11.1%	9.1%	12.7%	11.1%	1.22
Ratio (M/F)	1.04	1.07	1.22	0.84	
Rehabilitation Care/Prostheses					
Female	2.3%	1.1%	2.4%	3.7%	3.36
Male	3.0%	2.3%	2.6%	5.4%	2.35
Ratio (M/F)	1.30	2.09	1.08	1.46	
Cardiac Dysrhythmias					
Female	1.2%	0.7%	1.2%	2.1%	3.00
Male	1.2%	0.7%	2.0%	0.5%	0.71
Ratio (M/F)	1.00	1.00	1.67	0.24	

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER-AGE SUBGROUP HOSPITAL DISCHARGE RATE DIFFERENCES
SELECTED MOST FREQUENT PRIMARY PROCEDURES (1996-98)
(TABLE 19)**

- Men's discharge rate for PTCA was more than double that of women overall (Ratio M/F = 2.32) and in each age group.
- On the other hand, the discharge rate for total/partial hip replacement among men was only 69 percent that of women overall (Ratio M/F = 0.69), but 1.7 times that of women in the oldest age group.
- Discharge rates for upper gastrointestinal endoscopy/biopsy and diagnostic heart ultrasound increased with age for both women and men. This pattern was evident only among men in the case of total/partial hip replacement and among women only for cholecystectomy and common duct exploration.
- On the other hand, for both women and men, the rate for diagnostic cardiac catheterization, and arthroplasty of the knee increased among those 75-84 but, among those 85 and over, dipped to below the 65-74 age group.
- The discharge rate for diagnostic heart ultrasound among women and men age 85 and over, and upper gastrointestinal endoscopy/biopsy among just men age 85 and over was 3.5 times or more that of their counterparts age 65-74 (Ratios 85+/65-74 = 3.50, 3.68, and 3.46, respectively).
- On the other hand, for both the oldest women and men, the discharge rates for PTCA, diagnostic cardiac catheterization and arthroplasty of the knee were between two-fifths and two-thirds of those age 65-74.

Table 19. Gender-Age Subgroup Differences in Hospital Discharge Rates for Selected Most Frequent Primary Procedures, Older Adults Age 65 and Over: 1996-1998

Procedures and Gender	Total	65-74	75-84	85 +	Ratio: 85+/65-74
PTCA					
Female	47.2	45.7	55.6	29.4	0.64
Male	109.7	113.7	112.2	64.3	0.57
Ratio(M/F)	2.32	2.49	2.02	2.19	
Diagnostic Cardiac Catheterization					
Female	60.1	59.5	71.5	29.9	0.50
Male	106.2	102.1	122.3	66.7	0.65
Ratio(M/F)	1.77	1.72	1.71	2.23	
Knee Arthroplasty					
Female	88.6	93.9	97.9	38.8	0.41
Male	71.1	70.0	79.9	39.9	0.57
Ratio(M/F)	0.80	0.75	0.82	1.03	
Hip Replacement					
Female	90.4	60.7	107.1	69.4	1.14
Male	62.5	47.0	78.0	119.7	2.55
Ratio(M/F)	0.69	0.77	0.73	1.72	
Upper GI Endoscopy/Biopsy					
Female	57.8	37.0	71.7	106.7	2.88
Male	58.1	39.3	74.9	135.8	3.46
Ratio (M/F)	1.01	1.06	1.05	1.27	
Cholecystectomy					
Female	40.8	37.2	43.0	49.8	1.34
Male	42.3	36.6	51.2	48.3	1.32
Ratio (M/F)	1.04	0.98	1.19	0.97	
Diagnostic Heart Ultrasound					
Female	41.9	24.5	52.6	85.7	3.50
Male	42.3	28.0	54.8	103.1	3.68
Ratio (M/F)	1.01	1.14	1.04	1.20	

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER-AGE SUBGROUP MEAN LENGTH OF STAY DIFFERENCES
SELECTED MOST FREQUENT PRIMARY PROCEDURES (1996-1998)
(TABLE 20)**

- For all procedures, there were generally only slight differences between women and men in mean length of stay, overall and across age groups. Overall, the largest difference was for cholecystectomy and common duct exploration where the length of stay for men was .7 days above that for women.
- Mean length of stay for PTCA, total or partial hip replacement, and cholecystectomy and common duct exploration increased slightly with age for both women and men. This pattern was only evident among men in the case of diagnostic heart ultrasound.
- Mean length of stay for women age 85 and over who had diagnostic cardiac catheterization and for both women and men who had cholecystectomy and common duct exploration was 1.3 days longer than for their counterparts aged 65-74.

Table 20. Gender-Age Subgroup Differences in Mean Length of Stay (In Days) for Selected Most Frequent Primary Procedures: Older Adults Age 65 and Over: 1996-1998

Procedures and Gender	Total	65-74	75-84	85 +	Ratio: 85+/65-74
PTCA					
Female	3.4	3.2	3.6	3.7	1.16
Male	3.0	2.9	3.1	3.6	1.24
Ratio (M/F)	0.88	0.91	0.86	0.97	
Diagnostic Cardiac Catheterization					
Female	3.6	3.2	3.9	4.5	1.41
Male	3.7	3.5	4.1	4.0	1.14
Ratio (M/F)	1.03	1.09	1.05	0.89	
Knee Arthroplasty					
Female	4.0	4.0	4.0	4.6	1.15
Male	4.4	4.3	4.6	4.6	1.07
Ratio (M/F)	1.10	1.08	1.15	1.00	
Hip Replacement					
Female	4.7	4.4	4.6	5.2	1.18
Male	5.1	4.8	5.2	5.6	1.17
Ratio (M/F)	1.09	1.09	1.13	1.08	
Upper GI Endoscopy/Biopsy					
Female	4.5	4.3	4.6	4.7	1.09
Male	4.1	4.1	4.6	4.3	1.05
Ratio (M/F)	0.98	0.95	1.00	0.92	
Cholecystectomy					
Female	4.7	4.1	5.1	5.4	1.32
Male	5.4	4.9	5.9	6.2	1.27
Ratio (M/F)	1.15	1.20	1.16	1.15	
Diagnostic Heart Ultrasound					
Female	4.4	4.0	4.7	4.4	1.10
Male	4.2	4.1	4.3	4.5	1.10
Ratio (M/F)	0.95	1.03	0.91	1.02	

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER-AGE SUBGROUP MEAN HOSPITAL CHARGES DIFFERENCES
SELECTED MOST FREQUENT PRIMARY PROCEDURES (1996-98)
(TABLE 21)**

- Across primary procedures, there were only slight differences in mean hospital charges between women and men, either overall or across age groups. The largest difference was seen for cholecystectomy and common duct exploration where the charges for men were nearly \$1,500 more than for women and nearly \$1,900 in the youngest age group.
- Mean charge for diagnostic cardiac catheterization increases slightly the older the age group, among both men and women. The same pattern is evident only among men in the case of knee arthroplasty, cholecystectomy and diagnostic heart ultrasound, and for women only, in the case of upper gastrointestinal endoscopy/ biopsy.
- The largest difference between the oldest and youngest age groups, more than \$1,700, is observed for diagnostic cardiac catheterization and cholecystectomy and common duct exploration.

Table 21. Gender-Age Subgroup Differences in Mean Hospital Charges, for Selected Most Frequent Primary Procedures Older Adults Age 65 and Over: 1996-1998

Procedures and Gender	Total	65-74	75-84	85 +	Ratio: 85+/65-74
PTCA					
Female	\$20,019	\$19,509	\$20,620	\$20,093	1.03
Male	19,209	19,136	19,335	19,203	1.10
Ratio (M/F)	0.96	0.98	1.07	0.96	
Diagnostic Cardiac Catheterization					
Female	11,446	10,945	11,888	12,678	1.16
Male	11,650	11,521	11,798	11,981	1.04
Ratio (M/F)	1.02	1.05	0.99	0.95	
Knee Arthroplasty					
Female	16,919	16,924	16,880	17,153	1.01
Male	17,752	17,559	17,947	18,681	1.06
Ratio (M/F)	1.05	1.04	1.06	1.09	
Hip Replacement					
Female	17,469	16,786	16,899	16,049	0.96
Male	16,665	17,324	17,588	17,583	1.02
Ratio (M/F)	0.95	1.03	1.04	1.10	
Upper GI Endoscopy/Biopsy					
Female	7,785	7,586	7,854	7,948	1.05
Male	7,930	7,704	8,222	7,721	1.00
Ratio (M/F)	1.02	1.02	1.05	0.97	
Cholecystectomy					
Female	11,394	10,398	12,320	12,259	1.18
Male	12,855	12,269	13,457	13,549	1.10
Ratio (M/F)	1.13	1.18	1.09	1.11	
Diagnostic Heart Ultrasound					
Female	7,774	7,514	8,285	7,173	0.95
Male	7,611	7,562	7,625	7,683	1.02
Ratio (M/F)	0.98	1.01	0.92	1.07	

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

**GENDER-AGE DIFFERENCES IN IN-HOSPITAL MORTALITY
SELECTED PRIMARY PROCEDURES (1996-98)
(TABLE 22)**

- The percentage of male discharges age 65-74 with PTCA surgery as the primary procedure who had died in the hospital was about one-half that of their female counterparts (2.3 vs. 1.3 percent). In contrast, the percentage of men age 85 and over who had PTCA surgery and died in the hospital was 1.6 times that of women in the same age group (7.4 vs. 4.6 percent).
- Men age 85 and over who underwent a diagnostic cardiac catheterization procedure were 2.6 times more likely to die in the hospital than were their female counterparts (7.1 vs. 2.7 percent).
- Among both female and male discharges, the percentage who died in the hospital increased with age for both PTCA and diagnostic cardiac catheterization. This pattern was also apparent for men only in the case of hip replacement and women only in the instance of cholecystectomy.
- For both PTCA and diagnostic cardiac catheterization procedures, the positive relationship between age and in-hospital mortality was much stronger for men than women with an especially pronounced jump among men 85 and over.

Table 22. Gender-Age Subgroup Differences in Percentage Who Died in the Hospital for Selected Most Frequent Primary Procedures Older Adults Age 65 and Over: 1996-1998

Procedures and Gender	Total	65-74	75-84	85 +	Ratio: 85+/65-74
PTCA					
Female	2.3%	1.5%	2.8%	4.6%	3.07
Male	1.3%	0.7%	1.7%	7.4%	10.57
Ratio (M/F)	0.56	0.47	0.61	1.61	
Diagnostic Cardiac Catheterization					
Female	1.6%	1.1%	1.7%	2.7%	2.45
Male	1.9%	1.0%	2.7%	7.1%	7.10
Ratio(M/F)	1.19	0.91	1.59	2.63	
Knee Arthroplasty					
Female	0.1%	0.1%	0.1%	0.0%	—
Male	0.2%	0.2%	0.2%	1.5%	7.50
Ratio (M/F)	2.00	2.00	2.00	—	
Hip Replacement					
Female	1.3%	0.4%	0.4%	4.3%	10.75
Male	2.1%	0.8%	1.7%	7.5%	9.38
Ratio (M/F)	1.62	2.00	4.25	1.74	
Cholecystectomy					
Female	1.8%	0.7%	2.6%	3.2%	4.57
Male	1.9%	0.8%	3.3%	2.5%	3.13
Ratio (M/F)	1.06	1.14	1.27	0.78	

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

PRIMARY PAYER DISTRIBUTIONS (1996-98)

Four Most Frequent Primary Diagnoses (Table 23)

- Medicare was the major primary payer source for the four most frequent primary diagnoses ranging from 81 percent of all discharges for coronary atherosclerosis and other heart disease to over 88 percent for congestive heart failure.
- Medicaid was the primary payer for less than one percent of discharges for each diagnosis.
- Managed care was the primary payer for one of 17 coronary atherosclerosis and other heart disease discharges, one of 20 osteoarthritis discharges, and one of 33 pneumonia and congestive heart failure discharges.

Table 23. Primary Payer Distributions for Four Most Frequent Primary Diagnoses : 1996- 98

Primary Payer	Primary Diagnoses			
	Coronary Atherosclerosis and Other Heart Disease	Pneumonia	Osteoarthritis	Congestive Heart Failure
Total	100.0	100.0	100.0	100.0
Medicare	80.8	86.6	85.6	88.1
Medicaid	0.5	0.8	0.2	0.7
Other Government	5.9	3.6	1.9	2.5
Managed care	6.0	2.8	5.0	3.0
Commercial	4.1	3.1	4.2	3.0
Self-pay	0.6	1.0	0.5	0.6
Other	2.1	2.2	2.7	2.0

Note: "Other" includes Industrial Worker's Compensation, unclassified and unknown.
Percentages do not always sum to 100.0 due to rounding errors.

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

Four Most Frequent Primary Procedures (Table 24)

- Medicare was the major primary payer source for all four of most frequent primary procedures ranging from 80.6 percent of all diagnostic cardiac catheterization discharges to 86.4 percent of total or partial hip replacements.
- Medicaid was the primary payer for less than one percent of discharges for each procedure.
- Managed care was the primary payer for about one of 14 PTCA surgeries, one of 17 diagnostic cardiac catheterization procedures, one of 20 knee arthroplasty operations, and one of 25 total or partial hip replacements.

Table 24. Primary Payer Distributions for Four Most Frequent Primary Procedures : 1996- 98

Primary Payer	Primary Procedures			
	Knee Arthroplasty	Diagnostic Cardiac Catheterization	PTCA	Total/Partial Hip Replacement
Total	100.0	100.0	100.0	100.0
Medicare	84.6	80.6	86.4	83.9
Medicaid	0.4	0.6	0.3	0.7
Other Government	2.1	5.4	2.2	2.0
Managed care	5.2	5.8	3.8	6.7
Commercial	4.0	4.4	4.2	4.5
Self-pay	0.4	0.6	0.5	0.5
Other	3.3	2.5	2.7	1.8

Note: "Other" includes Industrial Worker's Compensation, unclassified and unknown.
Percentages do not always sum to 100.0 due to rounding errors.

SOURCE: Utah Inpatient Hospital Discharge Database, 1996-98, Utah Department of Health.

REFERENCES

- Kramerow, E., H. Lentzner, R. Rooks, J. Weeks, and S. Saydah. 1999. Health and Aging Chartbook. Health United States, 1999. Hyattsville, MD: National Center for Health Statistics.
- Popovic, J.R. and L. J. Kozak. 2000. National Hospital Discharge Survey: Annual Summary, 1998. National Center for Health Statistics. Vital Health Statistics 13(148)
- Rolfs, Robert T. and Wu Xu. 1995. Uses of hospital discharge data for population-based health assessment. Utah's Health: An Annual Review.
- Stinner, William F., Ho-Youn Kwon, and Lydia Baal. 1983. The Growth and Distribution of Utah's Elderly Population. Research Report 81. October. Logan, UT: Utah Agricultural Experiment Station, Utah State University.

APPENDIX A: CCS (Clinical Classification Software) Classification of Diagnoses Used in this Report and Corresponding ICD-9-CM Diagnosis Codes

CCSDiagnoses Category Number	CCS Diagnoses Category Label	ICD-9 Diagnoses Codes
101	Coronary atherosclerosis and other heart disease	V4581, V4582, 4110, 4111, 4118, 41181, 41189, 412, 4130, 4131, 4139, 4140, 41400, 41401, 4148, 4149
122	Pneumonia (except that caused by tuberculosis or STDs)	00322, 0203-0205, 0212, 0221, 0310, 0391, 0521, 0551, 0730, 0830, 1124, 1140, 1144, 1145, 11505, 11515, 11595, 1304, 1363, 4800-4802, 4808, 4809, 481, 4820-4823, 48230-48232, 48239, 4824, 48240, 48241, 48249, 4828, 48281-48284, 48289, 4829, 483, 4830, 4831, 4838, 4841, 4843, 4845-4848, 485, 486, 5130, 5171
203	Osteoarthritis	V134, 71500, 17504, 71509-71518, 71520-71528, 71530-71538, 71580, 71589-71598, 39891, 4280, 4281, 4289
108	Congestive heart failure, nonhypertensive	430, 431, 4320, 4321, 4329, 43301, 43311, 43321, 43331, 43381, 43391, 4340, 43400, 43401, 4341, 43410, 43411, 4349, 43490, 43491, 436
109	Acute cerebrovascular disease	4100, 41000, 41001, 41002, 4101, 41010-41012, 4102, 41020-41022, 4103, 41030-41032, 4104, 41040-41042, 4105, 41050-41052, 4106, 41060-41062, 4107, 41070-41072, 4108, 41080-41082,
100	Acute myocardial infarction	4109, 41090-41092
226	Fracture of neck of femur (hip)	82000-82003, 82009-82013, 82019-82022, 82030-82032, 8208, 8209, 9053
106	Cardiac dysrhythmias	4270-4272, 42731, 42732, 42760, 42761, 42769, 42781, 42789, 4279, 7850, 7851
254	Rehabilitation care, fitting of prostheses	V520, V521, V524, V528, V529, V538, V570-V572, V5721, V5722, V573, V574, V5781, V5789, V579, V5882
237	Complication of device, implant or graft	41402-41405, 44030-44032, 56960, 56961, 56969, 99600-99604, 99609, 9961, 9962, 99630-99632, 99639, 9964, 99651-99656, 99659, 9966, 99660-99669, 9967, 99670-99686, 99689-99696, 99699
205	Spondylosis, intervertebral disc disorders, back problems	7201, 7202, 72081, 72089, 7209-7213, 72141, 72142, 7215-7218, 72190, 72191, 7220, 72210, 72211, 7222, 72230-72232, 72239, 7224, 72251, 72252, 7226, 72270-72273, 72280-72283, 72290-72293, 7230-7239, 72400-72402, 722409, 7241-7246, 72470, 72471, 72479, 7248, 7249,
55	Fluid and electrolyte disorder	2760-2769
153	Gastrointestinal hemorrhage	4560, 45620, 5307, 53082, 53100, 53101, 53120, 53121, 53140, 53141, 53160, 53161, 53200, 53201, 53220, 53221, 53240, 53241, 53260, 53261, 53300, 53301, 53320, 53321, 53340, 53341, 53360, 53361, 53400, 53401, 53420, 53421, 53440, 53441, 53460, 53461, 5693, 5780, 5781, 5789

APPENDIX B: CCS (Clinical Classification Software) Classification of Procedures Used in this Report and Corresponding ICD-9-CM Procedure Codes

CCS Procedure Category Number	CCS Procedures Category Label	ICD-9 Procedures Codes
152	Arthroplasty knee	8141-8147, 8154-8155
47	Diagnostic cardiac catheterization, coronary arteriography	3721-3723, 8852-8857
153	Hip replacement, total and partial	8151-8153, 8161-8164, 8169
45	Percutaneous transluminal coronary angioplasty..... (PTCA)	3601, 3602, 3605
70	Upper gastrointestinal endoscopy, biopsy	4223, 4224, 4513, 4514, 4516
146	Treatment, fracture or dislocation of hip and femur	7855, 7865, 4905, 7915, 7925, 7935, 7945, 7955, 7965, 7975, 7985
44	Coronary artery bypass graft (CABG)	3610-3619, 362, 363, 3631, 3632, 3639
193	Diagnostic ultrasound of heart (echocardiogram)	8872
84	Cholecystectomy and common duct exploration	5121-5124, 5141-5143, 5149, 5151, 5159
222	Blood transfusion	9900-9909
113	Transurethral resection of prostate (TURP)	603, 6021, 6029
48	Insertion, revision, replacement, removal of cardiac pacemaker	3770-3783, 3785-3789, 3794-3798
177	Computerized axial tomography (CT) scan head	8703
3	Laminectomy, excision intervertebral disc	0302, 0309, 805, 8050, 8051, 8059
78	Colorectal resection	4571-4576, 4579, 458, 4841, 4849, 485, 4861-4866, 4869
124	Hysterectomy, abdominal and vaginal	683-685, 6851, 6859, 686, 687, 689
76	Colonoscopy and biopsy	4523-4525

For more detailed analysis, please use reference tables on the internet at:
<http://hlunix.hl.state.ut.us/hda/technicalpublications.htm>